West River Watershed Management Plan

Appendix B: Watershed Survey Reponses

Survey Results - *paper and Constant Contact*

Watershed Management

updated: 10/22/2014

	1. What are you top five (or more) concerns/issues/priorities regarding the West River Watershed? - Responses					
Hitchcock	Stop trash from entering the river above Edgewood Park and depositing in the park during floods.	Control of invasive plant species.	Water quality.	Some kind of path along the river through New Haven.	The concrete trench through Westville Village was originally (c. 1983) specified to have trees along the banks to shade the water for habitat; this was not done.	
Fitzgerald	For the river itself - clean water, public access	For the watershed community - lack of jobs for young people, especially for poor youth.	For the watershed community - lack of equal education opportunity for youth.			
Anonymous	Prevent CSO overflows (e.g. increase green infrastructure, separate sewers)	Restore wetlands (e.g. eliminate phragmites)	Minimize pollutants (e.g. ban lawn pesticides/herbicides)			
Marchand	Cleanliness/biological integrity	Public accessibility	public safety of all users	economic development of surrounding districts		
Peruso	Educating the youth I work with about the West River Watershed. (priority)	Increasing public awareness around the natural resources provided by the West River	Learning more about the issues and threats to the West River Watershed - I personally need more education in this area before trying to educate my youth about it.	Networking with people who can come visit my after-school program and educate my youth more on the West River, which literally runs through some of their backyards.	Learning more about the flora and fauna surrounding the West River.	
Smith	Access to the River-(traffic and homeless people along river)	Poor water quality	stormwater control	trash in the river	control of invasive plants	
Cunningham	water quality - are sources of pollution (point and nonpoint) being assessed? - are local, state, and federal clean water regulations being enforced? (my ninth graders at the Foote School have been doing some basic water quality assessments for many years at West Rock Park, Chapel St. and other locations)	education about the need for regional watershed management	preservation of habitats for fish and wildlife	are fish and shellfish from the river safe for humans to eat?	how the changes resulting form the recently installed self-regulating tide gates being monitored?	is the fish ladder at Pond Lily being monitored and are herring returning?
Karato	Invasive species management	awareness (where are you on the watershed?)	rainwater runoff quality and quanitity improvement	habitat	water quality	safety
Riordan	Reverse NH BoE's decision to use artificial tuft at Bowen Field	Remove trash from rivers	improve water quality	verify that businesses (junk yards, etc.) from Rte 1 to harbor are not damaging West River	remove invasive and restore native plants	
Ciarleglio	Flooding in Woodbridge/removing Pond Lily Dam	dredging deepening the river back to its original state	Water quality.	making people in the neighborhoods aware of damage caused by runoffs into the river	monitoring wate rquality	
Anonymous	Flooding	fish passage	return river to natural state	have some type of trails long river	dredging certain areas in Woodbridge for better flow	
Anonymous	Clean Water	flooding				
Coyle	What are the health risks for people, wildlife, and vegetation	What are the future plans for CSO's to change into something else	How soon will water quality be within acceptable ranges	Elimination of invasive plants along watershed	fishing/shellfishing impaired areas - when will they be within normal ranges again? Signage posted or on internet for impaired areas.	
Beltran	Increasing education of a viable watershed	involving community residents in this process	process of improving water quality	spread of watershed concerns to all stakeholders and developers		
Champion	utilizing motivated youth groups to gather data	investigate lower West River below Orange Ave.	identify green infrastructure projects to seek funding to implement			
Deleo	ecological health	fish passage	recreation and educational opportunity	water quality	improve aesthetics (clean trash and invasive plants)	
Fay	sewage/CSO's/Green infrastructure	residential stormwater management	landfills, dumps, and leaching (Hamden, West Haven)	habitat restoration	community education around fishing and community participation in wading safety	
Helm	reduce CSO - especially pertaining to private property owners	increase public access to river - swimming, kayaking	reduce use of pesticides and lawn fertilizers	reduce flooding in street	visibility of green infrastructure projects	
Bonnett	CSO management plan lacks service control evaluation and implementation	lack of public awareness and education about CSO's and GI	lack of GNHWPCA working with citizen groups to identify neighborhoods with high flood rates that contribute to CSO's - we have asked for but do not have access to GNHWPCA information to launch public outreach efforts.			
	2. What would you most like to see as outcomes of the West River Watershed Based Plan? - Responses					

Hitchcock	Improve water quality.	improve human access to and visibility of river through New Haven, so it won't be treated as a sewer in the future. So much potential to be a visual focus in Westville Village instead of a concrete trench.	
Fitzgerald	In Edgewood Park, a management plan for the river itself, the surrounding trees, and erosion into the river.	a comprehensive plan for green stewardship in the entire watershed.	better public transportation within the watershed
Anonymous	Community engagement/involvement increases community awareness and investment in health of watershed.		
Marchand	The plan should give a prioritized list of concrete actions to be taken, along with a sense of what roles will need to be played by community members, government professionals, and elected officials.		
Peruso	Personally I am new to the organization and haven't been told much about it. I am hoping to make connections with people who are resourceful about the river and can be of some support/assistance to me educating my youth (who are residents of West River/Rock neighborhood) about the Watershed.		
Smith	A plan that gathers existing information and sets priorities for actions. A plan that will monitor and improve the water quality for all by educating the public and enforcing current clean water and other environmental laws.		
Cunningham	The river offers rich, diverse important habitats for fish and wildlife and scenic beauty as well, low		
Karato	Cross-jurisdictionary cooperation: towns working together toward a common goal.	private contribution (less reliance on outside money) both for construction and maintenance	
Riordan	A river as close to natural as is possible to have in an urban area		
Ciarleglio	I would like to see the Pond Lily Dam removed and the area channelized and usable for the public and the wildlife.	I would also like to see the area neighborhoods surrounding the river notified and instructed on what happens to the river when pesticides, fertilizers, animal waste happen near the river. Also, debris that flows into the river during flooding that has been left on or near the riverbed	
Anonymous	Pond Lily Dam Removed		
Coyle	To have a healthy watershed for use by all		
Beltran	can answer better after I've learned more - this is my first meeting. I'd like to help in the outreach process. I have good ties in the Newhallville community.		
Champion	plan for lower river	sites to install GI	
Deleo	a restored West River that will support wildlife both in and around the river	a river that is available to the public for recreational activities	a clean self-sustaining river system
Fay	a good basis to seek funding for (especially) the high cost of cleanups and projects.		
Helm	increase public awareness of how they can contribute to improved stormwater management	increase number of green infrastructure projects initiated by WPCA (large scale projects)	
Bonnett	broad engagement of citizen participation in helping make water quality better	avoidance of sewer plant expansion by demonstrating that a watershed based plan can work effectively to reduce CSO's	

	3. If you represent a municipality, do you see opportunities for the Watershed Based Plan to complement your efforts to improve water quality in the West River? Can you give specific examples? - Responses
Marchand	I hope that this more regional approach helps to strengthen the coalition already working on issues related to the West River watershed. My main focus so far on the question of water quality has been the GNHWPCA, which is a regional entity.
Peruso	Absolutely; as a nonprofit worker I would like some advice as to how I, on a very small scale, and with my youth can do projects that will help improve the water quality in the West River. I'm hoping that the Watershed Based Plan can help provide me with some ideas for projects.
Cunningham	I don't represent a municipality but I would like the water quality data that my students have gathered to contribute to the watershed based plan and for them to learn about the stakeholders and shaping of the plan.

Ciarleglio	Yes, The town of Woodbridge has been instrumental in helping the West River Restoration Committee to secure grants to remove the Pond Lily Dam and restore the area and they are very interested in restoring the West River and Knolds Pond in Woodbridge	
Coyle	More recreational accessibility to areas that are now impaired areas for future use once they are healthy water ways again.	
Deleo	town planning would incorporate best practices for future building	draining for large developments would have retaining ponds and wells

	4. What can you or your organization contribute to the Watershed Based Plan? - Other responses
Marchand	bully pulpit
Peruso	Community Service
Ciarleglio, Cunningham, Fitzgerald, Peruso	Data
Cunningham, Karato, Marchand, Smith	Expertise
Cunningham, Fitzgerald, Karato, Riordan, Smith	Advice
Fitzgerald, Karato, Peruso, Riordan	In-kind Services
Coyle	Hosting events at the Barnard Nature Center at West River Memorial park in New Haven
Beltran	outreach assistance
Beltran	organizing volunteer efforts
Fay	meeting site
Fay	some community outreach
Fay	residential stormwater management classes
Fitzgerald	Friends of Edgewood Park
Marchand	I'm an elected official with a passion for environmental issues and some expertise in land use and zoning issues. I have learned a great deal about how things work in city government but still have much to learn.
Karato	Background in: civil engineering, landscape architecture, architecture, urban planning and urban design.
Ciarleglio	I am not sure if this would benefit you or not - but i have studies that were done in the 1980's regarding the West River in Woodbridge and part of New Haven up to the Pond Lily Dam. Also a study that Milone and McBroom did a few years back for the same area. I can provide them if you should need them
Deleo	we help with river clean-ups and communication with residents and town officials
Helm	Garden Club of NH - plant/horticulture knowledge; wide distribution of public information; wide network base; considerable knowledge about stormwater management; interest in small project investment
Bonnett	citizen outreach - how to manage stormwater on your property

	5. Are you interested in becoming a member of the Steering Committee? - Comments		
Fitzgerald	No. There are plenty of good people who want to join. I prefer to help facilitate the WRWC and work with the Friends of Edgewood Park.		
Peruso	No, Only because I don't know what that entails-I would need to learn more about the responsibilities of that role.		
Cunningham	?, I'm interested but would need to know the level of commitment required		
Ciarleglio, Karato, Coyle, Deleo, Fay, Bonnett	Yes		
Fitzgerald, Marchand, Peruso, Riordan, Smith, Beltran	No		
Helm	?		
	6. Would you like to volunteer for watershed activities? - Comments		
Marchand	?, I want to be involved, but exactly what I'll be able to contribute remains to be seen.		
Smith	already do		
Cunningham	I am a biology teacher at the Foote School in New Haven and naturalist. I am familiar with the flora and fauna of the watershed (especially the trees, birds, reptiles, amphibians fish and aquatic insects). My ninth grade students have conducted water quality studies for many years and I used to live near the River but I currently live about an hour from New Haven in Deep River Ct. I participated in the Yale Bulletin published in 1998.		
Cunningham, Fitzgerald, Karato, Marchand, Peruso, Riordan, Smith, Coyle, Beltran, Champion, Deleo,	Yes		
	7. Are you interested in participating in community workshops for the Watershed Based Plan? - Comments		
Fitzgerald	Possibly. If I know about the content of the workshops, I probably won't attend.	If you are in need of a mediater or facilitator at the workshops, Frank Cochran enjoys doing this, is trained, and is very good at it. (However, if he does that he won't have opportunity to share his ideas).	
Marchand	Yes, I think I can help a great deal in making such public workshops happen--getting venues, inviting elected officials and government staff, and raising awareness in the community.		
Anonymous	Yes, I would like to participate at some level.		
Coyle	Yes, Anyway I can help to improve this watershed. I would like to assist in this process for a healthy watershed for all.		
Ciarleglio, Cunningham, Fitzgerald, Hitchcock, Karato, Marchand, Peruso, Riordan, Smith, Coyle,	Yes		
	8. Can you recommend an other organizations, businesses, or individuals who might be interested in providing input to the Watershed Based Plan? (Please provide contact information if available. Thanks!) - Responses		
Fitzgerald	You have what I've got, except for a new contact from West Haven recruited by Stephanie Ciarleglio. She is the city clerk there. She will attend the next WRWC meeting. She knows lots of people. Deborah Collins, 203 937-3535, dcollins@westhaven-ct.gov		
Marchand	Representative Pat Dillon, District 92, 203-623-9717 cell	I would recommend that this Steering Committee keep in mind the Community Management Teams, which meet every month in the twelve police districts of New Haven. These meetings provide valuable spaces for engagement with the public.	I also call your attention to the City Services & Environmental Policy Committee of the New Haven Board of Alders. I sit on that committee, and I have a very good working relationship with CSEP Chair, Alder Sal DeCola. Even if this group does not end up proposing legislative action at the City level, CSEP is another useful space for public engagement on issues related to the environment.

Peruso	No- On the contrast, I actually need contacts like these for myself. I have only been with Solar Youth for a short time so I am just becoming familiar with local organizations like yours!
Smith	Southwest Conservation District, Roman Mrozinski (203) 287-8179 x 113
Cunningham	EPA,DEEP,Water Pollution Control Authority, City of New Haven Parks, New Haven Land Trust, New Haven Bird Club,Yale School of Forestry and Environmental Studies, Common Ground Charter School, Sound School, Aquaculture Magnet School, Beecher Elementary School, Chamber of Commerce, West River Neighborhood Association
Karato	ASLA (american society of landscape architects), ASCE (american society of civil engineers), CSCE (ct society of civil engineers), AIA (american society of architects), LBC (living building collaborative), AFH (architecture for humanity)
Coyle	I will e-mail the two groups that come to mind.
Deleo	Woodbridge Economic Development Commission
Fay	I will try to identify some Hamden people to participate
Bonnett	West Haven and New Haven individuals and businesses

9. Do you have any other ideas, advice, or words of wisdom that might be helpful to the Watershed Based Plan? - Responses

Fitzgerald	Take time to do outreach and listen to people. There are plenty of community minded citizens who don't do the internet and don't have college degrees.
Marchand	I wish I had more wisdom than I currently possess, but I'm sure I'll think of other things as we go forward. I expect to gain wisdom from you!
Smith	Include local community input
Cunningham	Try to ensure that goals are clearly stated, all stakeholders get an opportunity to participate, and all decisions are based on the best scientific data possible.
Karato	The goals should include technical, engineering aspects but also social and economic points. The core, I hope, is to help residents develop a watershed based environmental ethic that drives them toward participating in the improvement of their environment and daily lives.
Coyle	This is a good start to a good plan for future watershed good health for the future of all.
Deleo	We would like to see greenways and contamination buffers along the river. I would like to see habitat restoration for river herring. The West River has the potential for becoming a fine fishery. I would like to see today's yound people have the same opportunity to enjoy fishing and hiking along the river as we did. We should improve it and preserve for future generations.
Gyure	I have a mercury analyzer if Hg assessment is part of the heavy metal monitoring plan. I am happy to collect samples, analyze them for Hg etc… at minimal cost. It is an ideal instrument for working with students. Hg has long been a problem in CT watersheds in these areas... I believe there is some baseline datat though I can't put my hands on the report right now.
Macdonald	CT DEEP's mosquito management program has been controlling phragmites north of the tide gates between Route 1 and Derby St and at the Edgewood Park duck pond. There is a giant swath of phragmites between Derby Street and Chapel Street that has not been part of their control program, given limited funding. Paul Capotosto and Roger Wolfe run the program and have a per acre cost that could easily be calculated for this area. They would be happy to include this site in their control program if funding were available. Although this is not strictly related to water quality, it would benefit the habitat quality of the West River and provide for a relatively cheap and very visible project.

West River Watershed Management Plan

Appendix D: Project Steering Committee Meeting Summaries

West River Watershed Management Plan Kick-Off Meeting
Held at Neighborhood Housing Services of New Haven
October 16, 2014 - 2pm
Save the Sound/Connecticut Fund for the Environment and Fuss & O'Neill
Meeting Minutes

Fuss & O'Neill (F&O) – Erik Mas, Kris Baker, Megan Flanagan
Save the Sound / Connecticut Fund for the Environment (STS) – Kendall Barbery
Transcribed by Annalisa Paltauf – *Save the Sound/Connecticut Fund for the Environment*

1. Welcome from Kendall Barbery (STS).
2. Agenda overview by Erik Mas (F&O) and introductions of meeting attendees.
3. Slideshow presentation by Erik Mas (F&O) – see attached pdf of slides.
    a. Page 5, Slide 1: Erik asked the group if any studies from the list were missing.
        i. John Cunningham (Foote School) – Said students have been monitoring the West River by Amrhyn Field in New Haven for years.
        ii. Mary Mushinsky (West River Watershed Coalition - WRWC) mentioned that SCSU professors recently did studies on the West River.
        iii. Kathy Fay (Neighborhood Housing Services - NHS) – Knows of studies conducted at Beaver Pond in New Haven.
        iv. Colleen Murphy-Dunning (Urban Resources Initiative - URI) – Said she has copies of the Beaver Pond studies; also for Edgewood Park in New Haven.
        v. Frank DeLeo (WRWC) – Milone & MacBroom engineers conducted studies at Pond Lily in New Haven.
        vi. Harry Coyle (New Haven Parks Dept.) – Quinnipiac PhD students have been studying the West River.
    b. Page 6, Slide 5:
        i. John Champion (STS) – Asked if teenagers can be trained for the stream assessments to take advantage of the school and youth groups in the area. Erik replied that having the support of students working with a knowledgeable team leader would be ideal; however assessments are usually done during the summer so gathering student groups might be difficult. Chris Malik (CT DEEP) – Mentioned that even if students are unavailable for the assessments, they can still do the data entry and data processing during the school year.
        ii. Colleen Murphy-Dunning (URI) – Asked a question about retrofit and how sites are chosen. Erik said sites on public lands are looked at first. Trish Helm (NH Garden Club) – asked about approaching private homeowners. Erik responded that some walking of peoples' backyards along the river will be done and that raising awareness to the public is necessary. Erik also said it is less common to do retrofits on private sites, except some industrial areas, because compliance of private owners is difficult to arrange. Chris Malik (DEEP) – Brought up that this is an ongoing project and it can be determined later if anything can be accomplished on private property.
        iii. Kathy Fay (NHS) – Suggested identifying clusters of residential areas that contribute to combined sewer overflows (CSO's) and perhaps those private owners can be a part of the project sites. Erik replied they will to through the City's info on CSO's to identify private residential areas of large impact.

iv. Harry Coyle (NH Parks) – Offered the Barnard Nature Center as a site for the stream assessments as there is parking and easy access to the river. Also mentioned that he is working with a PhD student from WCSU at Barnard School on water quality issues and will send Erik that person's contact information.
v. Mary Mushinsky (WRWC) – Asked if this is the NRCS method. Erik replied that the plan will be based on a modified EPA method that mimics the NRCS method.

c. Page 7, Slide 3:
i. Kathy Fay (NHS) – Requested that even if people in this group are not interested in being on the steering committee they can reach out to and advertise the meetings to people and groups they know.
ii. Kendall Barbery (STS) – The online questionnaire will continue to be available and can be submitted online; link here: http://survey.constantcontact.com/survey/a07e9xl40uni0trhin0/a00fi19bfi4w/greeting

4. Q&A by Erik and Kendall:
a. John Cunningham (Foote School) – Asked if data is needed on heavy metals and bioaccumulation. Erik – If the data is available, we will take it. Will also look into DEEP fisheries for that information.
b. John (Foote School) – Asked if there are areas that DEEP has designated as impaired and if people are working in the river, do they need to totally stay out those certain areas. Ron Walters (South Central Regional Water Authority – RWA) – Said DEEP is creating a website for this information. Chris Malik (DEEP) – DEEP is working on a "real time" website listing CSO and water quality information. As a precaution, when working in the river, do not touch your mouth or eyes and wash hands well afterwards.
c. Lynne Bonnett (Greater New Haven Water Works Coalition - WWC) – Mentioned that Beaver Pond is a surface release for an aquifer under Newhallville and has large amounts of contaminants and heavy metals. The water source of the aquifer is on Sherman Ave./Goffe St. Also mentioned that Hillhouse High School is planning to install large artificial turf over that toxic chemical site. Colleen Murphy-Dunning (URI) – Water quality testing has been done in that area to determine a baseline and Gabe Benoit has that information.
d. Mary Mushinsky (WRWC) – Suggested that when the project list is created to keep in mind some low-tech, low-cost projects as the watershed coalition group is volunteer-heavy and not heavy on engineers and money. Erik replied that small scale projects and quick fixes will be a part of the plan, as well as large retrofits. Mary (WRWC) suggested as an example a pitch to local dog owners about dog waste and how it relates to bacteria levels in the river.
e. Lynne Bonnett (WWC) – Mentioned that her group has requested from the City of New Haven data on sewer plant and GIS information and they have not been successful. Asked Erik that if F&O is successful in obtaining this information to please share it and make it public.
f. Dawn Henning (Yale School of Forestry and Environmental Studies – FES) – Asked what pollutant load model will be used. Erik said it is a simple- to mid-level model F&O has used previously for watershed treatment plans. A major benefit is that the model has a wide range of practices from non-structural to engineered. Dawn asked if it accounts for increasing rain fall and climate change. Erik said they use an export coefficient model. Kris Baker (F&O) said the model uses existing conditions and does not take into account climate change.
g. Dawn Henning (FES) asked about metrics to assess management strategies. Erik said they focus on environmental benefits and that social and economic benefits are not covered under this scope. Chris Malik (DEEP) – Said that stakeholders will drive what will be done. Erik – Funding sources will be

identified and the stakeholders will have to go and run with it. People will be needed to see the projects through.

h. ?? – asked if anyone was present from the municipalities. A few people from the group replied that Woodbridge representatives are present. Kendall (STS) – Actively trying to recruit members from other towns. Also mentioned that Giovanni Zinn, the New Haven City Engineer, is on the steering committee but was unable to attend the kick-off meeting. Encouraged people present to involve other towns and to send the questionnaire to other people they know. John Champion (STS) – Noted that local elected officials are present.

i. John Champion (STS) – Brought up a walk along the lower West River that Chris Ozyck from URI led and said that area has been under-investigated – there are private salt marshes, dumps, etc. Harry Coyle (NH Parks) – The last mile of the West River is hard to access. John Champion (STS) – Asked how this section fits into the watershed plan. Erik – Said this section of the river will not be ignored, however the water quality is affected by what is going on upstream.

j. Maria Tupper (New Haven Bioregional Group - NHBG) – Announced that on Sunday, October 26, a walk is planned from the Sound School to Kimberly Ave in West Haven to the site where the mall is being planned.

k. Kathy Fay (NHS) – Capped dumps are leaching into the watershed, specifically the Hamden Transfer Station on Wintergreen Ave. Requested that any closed dumps and industrial waste sites be looked at. Erik replied that inventories of these sites will be included in the plan. Harry Coyle (NH Parks) – Mentioned the scrap metal sites in the watershed that may be leaching. Kathy (NHS) – The studies at Beaver Pond have found bullets in the mud (leftover from the arms manufacturing test sites) and asked about the amount of heavy metals leaching into that area.

l. Harry Coyle (NH Parks) – Suggested making the local businesses a part of the plan – educate, don't punish them. Erik – This is a voluntary process and it is a challenge getting the businesses involved. Reaching out to them is tough.

m. Aaron Goode (NHBG) – Brought up that New Haven is revising their comprehensive conservation plan and this watershed plan should be included. Adam Marchand (Alderman) – Said that he is the chair of the group revising this plan and the deadline is June 2015. The information-gathering process is complete but he can introduce other elements to the "comp plan". There is some, but not much, language for the West River corridor. Said we can work together to get this watershed plan into the comp plan.

n. Martin Mador (Mill River Watershed Coalition – MRWC) - Asked about the steering committee. Kendall (STS) – Currently there are eleven members and it is voluntary. Trying to recruit other members from other towns, especially Hamden and West Haven. Accepting recommendations for members. 15 people on the committee would be ideal.

o. Martin Mador (MRWC) - Asked how stakeholders are being identified. Kendall (STS) – Members of the WRWC are members of local businesses and organizations. Harry Coyle (NH Parks) – Suggested going through the Chamber of Commerce to get more people. Erik – There is a question about this on the questionnaire.

Meeting Attendees:

Doreen Abubakar, West River Watershed Partnership and Youth Council
Daniella Beltran, Community Building Specialist, Neighborhood Housing Services of New Haven
Lynne Bonnett, Greater New Haven Water Works Coalition
John Champion, Director of Green Projects, Save the Sound
Stephanie Ciarlegio, West River (Woodbridge)

Harry Coyle, New Haven Park Ranger, New Haven Department of Parks, Recreation & Trees
John Cunningham, biologist & teacher, the Foote School
Frank DeLeo, West River Restoration
Kathy Fay, Lab Manager, Neighborhood Housing Services of New Haven
Richard Furlow, New Haven Alderman, Ward 27
Chandel Gibbs, Americorps VISTA, Neighborhood Housing Services of New Haven
Aaron Goode, New Haven Bioregional Group
Trish Helm, New Haven Garden Club and Land Trust
Dawn Henning, student, Yale School of Forestry & Environmental Studies
Toshi Karato, Landscape Architect
Gwen MacDonald, Director of Habitat Restoration, Save the Sound
Martin Mador, co-founder, Mill River Watershed Coalition
Chris Malik, Watershed Manager, Connecticut Department of Energy & Environmental Protection
Adam Marchand, New Haven Alderman, Ward 25
Colleen Murphy-Dunning, Director, Urban Resources Initiative
Mary Mushinsky, Mill River Watershed and West River Watershed Coalitions
Annalisa Paltauf, Green Projects Administrative Assistant, Save the Sound
Markeshia Ricks, reporter, New Haven Independent
Dennis Riordan, Board President, Audubon Connecticut
Esther Rojas-Garcia, Director of Ex Affairs, Solar Youth
Pablo Sanchez, visitor
Joanne Sciulli, Executive Director, Solar Youth
Martha Smith, West River Watershed Coalition
Stacy Spell, President, West River Neighborhood Services Corporation
Kelsey Sullivan, Americorps VISTA, Neighborhood Housing Services of New Haven
Maria Tupper, New Haven Bioregional Group
Joel Tolman, Director of Impact & Engagement, Common Ground High School
Ron Walters, South Central Regional Water Authority
Gary Zrelak, Director of Operations, Greater New Haven Water Pollution Control Authority

Minutes additions

Pg 5, Slide 1:

Joel Tolman—students mapped outfalls at Konolds

Gary Zrelak, WPCA NH- GIS is available for the area on stormwater & CSO

Q&A

Q (unknown): Question about whether groundwater is included in the scope.

Erik: Groundwater falls under different regulations; this study focuses on surface water mainly. However, historical use/contamination will inform where retrofits are possible.

Connecticut Fund for the Environment/Save the Sound

West River Watershed Based Plan

Steering Committee Meeting Minutes

12/16/2014 2-4pm at Neighborhood Housing Services (NHS), 333 Sherman Avenue, New Haven, CT.

Minutes transcribed by Kendall Barbery and Annalisa Paltauf
Presentation by Erik Mas, Fuss & O'Neill, Inc.

Steering Committee Members present:

1. Kendall Barbery
2. Kathy Fay
3. Ron Walters
4. Chelsea Auerbach
5. Kelsey Sullivan, NHS
6. Frank Cochran
7. Chris Malik
8. Frank DeLeo
9. Gary Zvelab
10. Adam Marchand
11. Mary Mushinsky
12. Giovanni Zinn

1. **Welcome**, introductions and review of agenda by Kendall; turned floor over to Erik Mas for presentation.
2. **Summary of the Watershed Survey**
    a. 18 responses total
    b. Top issues: CSO, GI, water quality, and invasive species
    c. Desired outcomes: Green infrastructure projects and master plan; improved water quality; community engagement
        i. One respondent wants a river restoration plan specifically for Edgewood Park.
3. **Review of the Technical Memorandum #1: The State of the Watershed**
    a. The memo is an assessment of existing conditions and a review of available information that will help identify issues and prioritize goals.
    b. Findings include:
        i. The West River Watershed is diverse urban watershed in different settings ranging from rural forested river to urban, to urbanized salt marsh and tidal river.
            1. Forested lands in upper parts of the watershed have a higher water quality than downstream.
            2. Downstream areas are impacted by development – both historic and current, including old mill dams and relics of industry, as well as impacts from urbanization.
            3. West Rock is dividing line between upper rural and more urban parts of the watershed.
            4. There are 8 major sub-watersheds, which span 6 municipalities. Most of the watershed is in the town of Bethany (29.8%), followed by Hamden (26.7%), New Haven (19.7%), Woodbridge (17%), West Haven (6.5%), and Prospect (0.2%).

ii. Previous Studies:

1. West River Memorial Park – probably the most studied area in the watershed.
    a. Phragmites flourished in the former salt marsh after tide gates were installed. But in 2012 – the self-regulating tied gates have changed the environment of the river.
2. Edgewood Park – also studied
    a. Duck Pond impaired due to bacteria
    b. City of New Haven has done some trail and sign improvements
    c. Friends of Edgewood Park do a lot of clean-up, maintenance, and other activities
3. Pond Lily –
    a. Dam originally constructed ~1780.
    b. CT Fund for the Environment was awarded funding to remove the dam as a part of a post-hurricane Sandy resilience grant; removal planned for 2015
4. Beaver Pond Park
    a. Also a site with an active Friends group
    b. Multiple studies on invasive plants, land management, and trash
5. Combined Sewer Overflow (CSO) abatement
    a. A major focus in lower part of the watershed
    b. Sewersheds/CSO Regulators #003 and #004 contribute about 80-85% of the overflows to the West River
    c. The Greater New Haven Water Pollution Control Authority (GNHWPCA) has hired an engineering firm to investigate the use of GI in conjunction with more traditional (grey infrastructure) mitigation efforts.
        i. Gary Zrelak (GNHWPCA) noted that the WPCA recently updated their hydraulic model, which showed further reductions in overflows. Efforts to increase the height of the weirs on the outfalls and the update to the hydraulic model are helping to bring overflows to a manageable volume that green infrastructure can actually address.

iii. Land Use & Land Cover

1. Land use – what is on the ground, how it is being used.
2. Land cover – what is covering the land from an aerial perspective.
3. On the map, red = hardscape, anything built or developed; green = forest; yellow = turf, grass, lawn, cemeteries, etc.
4. Historic and current land use compared in 1934 – 2012 aerial photos
    a. Southern half of the watershed was already highly developed back in 1934.
    b. 1930's – more active farms which have now filled in with forest; there is more forest in the upper watershed now than in the '30s.
5. Impervious cover
    a. Impervious cover is a good surrogate for measuring water quality and stream health.
        i. As imperviousness increases, the more degraded the streams become. Pavement generates runoff during storms. Because the land is paved, the water can't soak up into the ground and usually ends up in a stream, which causes it to be flashy (or flood more

quickly). When water can soak into the ground, it improves groundwater—which contributes to base flows in rivers, and reduces flashiness.

b. UCONN has done state-wide analysis estimating impervious cover.
    i. Stream water quality degrades as impervious cover increases.
        1. At 10% impervious cover you start to see impact to water quality and stream conditions.
        2. 25-60% - non-supporting range.
        3. in CT – the lower threshold to impact streams is 12%.
c. The upper watershed is between 0-10% impervious.
d. The lower watershed is very densely developed area with more than 25% impervious cover in some areas.

iv. Pollutant loads – i.e. how much bacteria is getting to the West River annually.

1. How much bacteria are being loaded based on land use, CSO discharge, septic systems, etc.
    a. 84% of bacteria load is from CSOs; 10% from non-point source runoff (roads, driveways, stormwater runoff); 6% from septic/illicit connections.
        i. Giovanni Zinn – Does this account for natural sources of bacteria such as wildlife? Erik Mas– yes, they are embedded in the land use coefficients in the pollutant load model that we used.
2. Once we have recommendations we will plug them into the model to get estimated load reductions.
3. Model inputs based on monitoring data from UCONN. NPS – precipitation per year – 47" rain/year x% converted to runoff. Runoff volume x pollutants (based on land cover type and land use type).
    a. Frank – does this incorporate real data from the WPCA and modeled data for non-point sources. Erik – it incorporates some existing data, but a lot of the data beyond what the WPCA has is sporadic and inconsistent. Without doing a detailed study about illicit connections, we have to make assumptions, and that's where the model comes into play.
4. Annual bacterial yield by sub-watershed. In order to compare them – divide them per area (fecal coliform/acre).
    a. Lower West River – highest yield
    b. But there are also high yields in Beaver Brook and Wilmot Brook where there are no CSOs.

v. Water quality monitoring

1. DEEP water quality monitoring is the best and most consistent for the watershed.
2. A bacterial TMDL (or "pollution budget") was developed for the West River in 2012.
3. Wintergreen Brook and Edgewood Park Pond impaired due to bacteria.
    a. Wintergreen Brook flows through some very densely developed parts of the watershed between New Haven and Hamden
4. Frank DeLeo –What about from Konolds Pond to Pond Lily? Erik – that is also impacted and impaired by bacteria.

vi. Geology and soils

1. This is important because it influences the river itself, but also because it will influence our ability to do green infrastructure and low impact development in different parts of the watershed, due to infiltration rates/ability.
2. Soils with low infiltration capacity to the north; south – developed and altered land but potentially higher infiltration capacity – but also variability because soils may vary due to fill material used in building and development.
3. Need to do soil testing as a part of every project—to know local infiltration conditions as well as soil quality.

vii. **Wetlands**
1. 13% of watershed is mapped as state wetlands.
    a. State uses soil types to determine wetlands
2. 6% at federal level, which considers vegetation, hydrology, and soil conditions.

viii. **West River Tidal Marsh**
1. The West River tide gates opened up seven additional miles of the West River to tidal influence.

ix. **Stream buffers** – stream or riparian buffers – major role in protecting water quality, providing habitat, etc.
1. Loss of stream buffers due to development – map that shows stream buffer within 300 feet of the stream. Graduations based on land cover.
2. 35% loss of forested land within 300 feet of riparian corridor
3. Invasive plants widespread in disturbed corridors.

x. **Dams on the West River** – combination of water supply reservoirs and mill dams.
1. There are 31 dams on the West River
2. DEEP Fisheries folks – the lower stem of the West River is the only viable fishery along the main stem of the West River.
3. Wintergreen Brook has little potential for fisheries restoration due to culverting and impact of urbanization. Erik mentioned that he spoke with Steve Gephard about Wintergreen Brook and he thinks it has little restoration potential
    a. Kathy said she wasn't aware of any part of Wintergreen Brook being underground, and thinks maybe he is referring to Beaver Brook, which goes under SCSU—and may be worth looking into.
4. Konolds Pond – potential site for fish ladder after Pond Lily dam is removed.

xi. **Water supply**
1. Operated by the South Central CT Regional Water Authority
2. There are five major drinking water reservoirs in the watershed, all on Regional Water Authority land.

xii. **Wastewater**
1. Managed by the Greater New Haven Water Pollution Control Authority (GNHWPCA)
2. 47% of watershed area is served by the GNHWPCA, which is about 96% of the population. The rest is septic.
    a. Woodbridge & Bethany – septic – potential source of bacteria.
3. Much of New Haven has combined storm sewer pipes.
    a. There are 4 CSO outfalls along the West River
    b. Sewers 003 and 004 – 85% CSO volume contribution – based on 2014 data from WPCA.

c. The Truman Tank, a 5 MG tank in the parking lot of the Truman School is a temporary holding tank for combined storm sewer water in the lower watershed. The water in the tank is eventually pumped to the East Shore water treatment plant.

4. CSOs – New Haven has new stormwater regulations.
    a. (Stormwater that flows through the separate storm sewer system
    b. There was a push to establish a stormwater authority which has been unsuccessful to date. Cities across the state are looking at fee systems as a way of maintaining stormwater infrastructure.
    c. MA, VT, ME have stormwater authorities.

xiii. Green Infrastructure Focus Areas

1. There are several green infrastructure projects in design and a few others have been constructed.
2. The GNHWPCA is also doing a green infrastructure suitability pilot study in the lower portion of the watershed (sewersheds #003 and #004)
3. Recommendations for green infrastructure in the Watershed Plan will take into account work that is ongoing and that has already been done.
    a. Desktop screening analysis of land use/land cover, soil type, CSO/nonCSO areas will inform recommendations and preliminary site selection. The team will verify field conditions with site visits.
4. Kathy – folks that are interested in community engagement are looking for guidance on where to focus their efforts – 003 and 004 are most impactful – but may be looking at those for large projects already – or go elsewhere?
    a. Giovanni – we want to see those happen everywhere, especially in CSO areas, but also concerned about slice going into separate area.
    b. Erik – CSO 003 and 004 may be better for larger projects. Residential LID – tough to implement but educational benefits.
    c. Giovanni – the more gutter leaders we disconnect, the better.
    d. Gary – you should be addressing stormwater at the same time. Because as CSOs reduce, the slice of bacteria contamination from non-point sources gets bigger.
    e. Frank – spoke about outfall that goes into the main stem of the West River – wondering if it could be rerouted to the reflecting pool.
    f. Gary – The State is talking about relocating the outfall because it is creating scour under the bridge where it is located—it is the Derby Ave outfall #005 right under Route 34 into the bridge abutment.

xiv. Flooding

1. The lower West River was altered within the past 100 years.
2. 1982 flood of record in New Haven –
    a. Led to channelization of West River near Blake Street.
    b. Wilmot Brook flood control structures
    c. and Woodbridge Flats Flooding Study.

4. Watershed Plan Goals

a. **Goal #1**: Improve the water quality of the impaired segments of the West River and its tributaries by reducing loadings of bacteria and other pollutants. Consistently meet water quality standards for recreation and aquatic habitat.

i. Discussion:

1. Is there anything we've missed? Improve water quality of West River and tributaries by reducing loading of bacteria and other pollutants. Some of the recommendations will be about monitoring – where to hone in – to identify sources.
2. Ron – how reasonable is this goal, due to development?
3. Erik – once CSOs are reduced, how much of the rest of the picture is effective or reasonable to reduce – maybe 5-40% after CSOs down.
4. Ron – if we need 95% reduction in bacteria…
5. Mary – …we may never get there.
6. Erik – after CSOs reduced, 0-30% of 10% NPS
7. Chris – we'll have storms where water quality will be exceeded, but we can have effective treatment over the long term. Referred to Norwalk – change over 20 years. A big part of this is also improving base flow.
8. Mary – should we amend this so that we're talking about doing this a section at a time?
9. Erik – that could be a discrete first step – maybe that could be a part of the phasing.
10. Giovanni – but you don't want to create a situation where only people are engaged in their section when it is their time – we want people to be engaged broadly.
11. Erik – a good way to develop the recommendations.

ii. Suggestions: Consider incorporating the following into Goal #1

1. Repair the connection with the river
2. Know more background and details about the area (i.e. sources of pollution)
3. Centralize available data
4. Address the impaired reaches in phases.

b. **Goal #2**: Protect and enhance high quality and unimpaired waterbodies

i. No discussion, no comment

c. **Goal #3:** Protect and improve terrestrial, riparian, and aquatic habitat

i. Suggestions:

1. Consider replacing "improve" with "restore"
2. Use a more common word to describe streamside than "riparian"
    a. There was some debate about this. Some think it is just fine for the document because it is true to the style of reporting, but that we should alter our own language when we are making presentations to the public.

d. **Goal #4:** Promote stewardship of the watershed through education and outreach

i. Suggestions:

1. Add "…and access"
    a. Or make "access" its own goal?

e. **Goal #5**: Strengthen and build local capacity to implement the watershed plan

i. Discussion:

1. Chris – piggy-back on development projects.

ii. No suggestions

f. **Other goals**?

i. Discussion:

1. Erik – for each goal there will be more detailed objectives.

2. Adam – I think we ought to be bold and go for it. Mentioned greenway designation. Will get that info for Erik Mas.
3. Frank – where to invasives fall on this list?
    a. Erik - #3, habitat.
4. Frank D also mentioned Pond Lily and stressed the importance of the planned dam removal in influencing recommendations for the plan.

ii. Suggestions:

1. Mention economic development and connectivity
2. Also connectivity through the watershed, by way of the Green Way Designation

g. Erik will edit and send around revised goals for comment.

5. Next Steps:

a. December – March LID & Green Infrastructure Assessment
b. February – review a draft of Task 3, the LID and Green Infrastructure Assessment
    i. Depending on weather conditions – may have to push that back a little.
c. March and April – community workshops
    i. Kendall mentioned that we will likely host the community workshops it a couple of different locations throughout the watershed
d. April – August – watershed plan development
e. Spring 2015 – Stream Assessment Training
f. Summer 2015 – Stream assessments with trained volunteers
g. Discussion:
    i. Gary – how will the GI assessment occur?
    ii. Erik – desktop study – but Erik can coordinate a field visit with members of the group – will develop a list.
    iii. Giovanni –On public property?
    iv. Erik – primarily.
    v. Giovanni – City has adopted NYC designs of Howard Ave – anytime we are touching in the city, we are trying to get something in the ground, aiming for 40-50 of those things by next year. Using standard design to decrease costs and ease maintenance in the future. Rt. 34. Farman Courts Housing Authority – 8-10 bioswales.
    vi. Erik – if you have copies of standard details, could you share them?
    vii. Mary – on GI – if we can put anything in the report that is "people-based" and not expensive engineering solutions – organizing a block of people to do a certain thing – social pressure.
    viii. Kathy – starting to do this and finding receptive people – even with no resources. It would be a pity to say that residential stuff is small potatoes. Even if not the largest impact it has impacts on connectivity and stewardship.
    ix. Giovanni – something that would be helpful to me is looking at where other programs are being implemented. Where residential programs are working and how are they working.
    x. Kendall – I will share some research with Giovanni/Erik that may be able to inform our program in New Haven.

6. Wrap up: 3:55pm

Connecticut Fund for the Environment/Save the Sound
West River Watershed Based Plan
Steering Committee Meeting #2 Minutes

04/22/2015 at Neighborhood Housing Services (NHS), 333 Sherman Avenue, New Haven, CT 10am-12:30pm

Minutes transcribed by Annalisa Paltauf, Save the Sound
Meeting facilitated by Kendall Barbery, Save the Sound
Presentation* by Erik Mas, Fuss & O'Neill, Inc.

*PDF slide presentation attached – slide numbers in lower left hand corner of each page

Steering Committee Members present:

1. Kendall Barbery, Save the Sound
2. Frank DeLeo
3. Chris Malik, DEEP
4. Ron Walters, Regional Water Authority
5. Kelsey Sullivan, NHS
6. Frank Cochran
7. Courtney McGuinness, Quinnipiac University
8. Gary Zrelak, GNHWPCA
9. Lynne Bonnett
10. Kathy Fay, WRWC, NHS
11. Chelsea Lane-Miller

1. WELCOME, introductions and agenda overview from Kendall Barbery (STS) (slides 1-2)
    a. New member Courtney McGuinness, Assistant Professor at Quinnipiac University

SLIDE PRESENTATION BY ERIK MAS (F&O):

2. OVERVIEW OF UPDATES TO TECHNICAL MEMO #1:
    a. GNHWPCA updated their Hydraulic Model – West River Plan updated to reflect those updates
        1. Slide 4 –
            a. The four bullets are only part of a longer list of changes – all to be completed by 2018.
            b. Changes are focused on outfalls 3, 4, 5, 6, and the Truman Tank.
            c. Will result in significant reduction of CSO's – reduce frequency as well as enhancements to the storage tank
            d. GNHWPCA updated the model per regulatory mandates – these projects and updates are imminent.
        2. Slide 5 –

a. F&O updated pollutant model based on GNHWPCA changes – Historically, according to GNHWPCA models, CSOs contributed approximately 70-80% of the annual fecal coliform bacteria load to the West River. The GNHWPCA's revised model—which accounts for improvements that have been made to the sewer system, as well as imminent improvements to the Truman Tank and other infrastructure—shows a substantial reduction in combined sewer overflows from almost 50MG annually to under 15MG annually—and a subsequent decline in the percent contribution to 19% of the total annual FC load..

3. Slide 6 –
    a. CSO's are an issue, but non-point run-off and illicit connects are biggest concerns.
        i. What is an illicit connection? Anything non-stormwater getting into the stormwater system, such as leaking sewer, washing car, changing car oil, old plumbing leaks and tie-ins. These are problems because they take up volume at the treatment plant and overwhelm its capacity.
        ii. Someone mentioned a Mamaroneck River Study where CSO's were removed but illicit connections were not addressed and bacteria loads were still high.
    b. Gary mentioned that the imminent work is relatively straightforward—in terms of cutting a baffle in the Truman Tank and raising weirs in the regulators along the trunk sewer—but some requires longer term planning because of traffic and safety concerns. The regulator on Derby Ave is in the middle of a busy intersection and the GNHWPCA is looking to move the regulator into West River Park to ease access issues—a project which they plan to complete by 2018.
    c. These models are based on routine rain storms, not large intense storms. F&O model goes by annual rainfall, which has an adjustment factor for climate change.
    d. The first inch of rain is responsible for most of the pollutants.
4. Slide 7 –
    a. GNHWPCA requires private developers to address stormwater in CSO areas. This requirement has resulted in 14 projects in the West River Watershed and is at cost to the developers, which is more cost-effective than making rate-payers pay.
5. Slides 8-9 –
    a. Example projects implemented in CSO areas
    b. Slide 9: Large plastic pipes installed below parking, in bed of stone – used for infiltration or storage – in CSO areas. Below-ground is good because we can use the land above it, but not good because it is not visible/no educational value. The environmental benefit is that it reduces volume through infiltration and reduces pollutants.
        i. Some group comments and questions about municipally-required stormwater control plans – Gary said that in CSO areas there are strict GNHWPCA requirements, but outside the CSO areas they have no say.
6. Slide 10 –

        a. There are "Green Redevelopment" projects across the city, including 14 in the West River Watershed.
    b. Maltby Lakes Contributing Area (Orange/West Haven)
        1. Slide 11-12 –
            a. F&O added Maltby Lakes to watershed per GNHWPCA comments.
                i. There is a difference in the DEEP mapping and actual drainage: Maltby Lakes DOES flow into the West River, NOT the Cove River.
                ii. The Maltby Lakes area is 70% owned by Regional Water Authority – land is protected and forested – rest of land is residential and owned by Yale Golf Course.

3. GREEN INFRASTRUCTURE ASSESSMENT
    a. Slide 13 –
        1. Desktop screening by F&O was first step – they created a list of priority sites.
            a. These potential sites and projects take into account and compliment work being done by other groups (GNHWPCA, City of New Haven, etc.). The GHNWPCA is focusing on projects in the Right-of-Way, for example, and F&O is focusing on projects on public parcels. Goal is to look at additional opportunities.
            b. This list of potential sites and projects provide a foundation for other groups to apply for grants and develop the projects.
    b. Slide 14-15 –
        1. Sites were identified with two major considerations: area does not meet water quality standards and/or is in a CSO area.
        2. Impervious (i.e. pavement and other hard surfaces) increase from north to south in the watershed. The upper portion of the watershed is below 10% imperviousness (shown in green on slide 14), while imperviousness exceeds 25% in some of the lower portions of the watershed (shown in red on slide 14). There is a relationship between the amount of impervious land surface and water quality of the streams, rivers, and other waterbodies that land drains to. Water quality impairments are noticeable once imperviousness reaches about 10%. The average amount of imperviousness for the watershed is 12%.
        3. The green hash-marked areas in slide 15 are combined sewer areas. Those green areas within the boundary of the West River watershed within the sewershed of the West River and stand to impact combined sewer overflows to the West River.
    c. Slide 16 –
        1. Within the target sub-watersheds, F&O targeted publicly owned parcels (low hanging fruit), because they are easier to work with than private land owners. Also, there are more large impervious areas than residential areas, so a lot of potential.
        2. Other key factors for site selection include soil characteristics and depth to groundwater and bedrock. Soil data were obtained from the NRCS for the desktop GIS screening, but no site tests have been conducted to verify soil conditions—this will need to be done by whoever chooses to develop the projects F&O proposes.
    d. Slide 17 –

1. The priority sites met subsurface soil criteria and owned publicly. Started with 358 sites public-parcel criteria. 63 of the 358 met additional soil screening criteria. F&O—joined by Kendall Barbery (both days) and Lynne Bonnett (Day 1)—evaluated 39 of the highest-priority sites in the field during two days in the field.

e. Slide 18-19 –
    1. 90% of the 39 sites have potential for GI/LID; eleven of them were identified for concept designs.
    2. Two additional sites from the original list of 39 were used in a 319 grant application developed by CFE/Save the Sound: Troup School and the Goffe Street Fire Station.
    3. The remaining 28 projects—along with notes and preliminary recommendations from the field scans—will be included in an appendix in the final report.
    4. Most of the proposed sites are in New Haven, West Haven, and Hamden.

4. CONCEPTUAL DESIGNS FOR THE ELEVEN PRIORITY PROJECTS
    a. Slide 20-21 – New Haven Adult Education Center, Domus Academy, & Helen Grant School, Lower West River Watershed, Ella T. Grasso Blvd, New Haven
        1. Large commercial site that is the home of three buildings; was old commercial or industrial property, in lower watershed, off the Boulevard.
        2. All pavement and roof – large impervious area.
        3. The water sheet flows directly into the river; also huge sediment/sand load.
        4. Pavement in poor condition, lack of vegetated buffer along river, invasive species present.
        5. There is a low point in the parking lot and the water flows down into the river untreated.
        6. Great opportunity to restore the buffer and add vegetation.
    b. Slide 22 – Design Concept
        1. This project would work best if retrofitted as part of an overall site redevelopment. However, opportunities exist in the meantime for riparian restoration and some stormwater runoff mitigation:
            a. Restore riparian buffer – there is 20-40 feet of area between pavement and the river – use low-growing native vegetation to provide water filtering and habitat.
            b. Proposed sediment basin/bioretention – stormwater management – to capture sand and/or infiltrate water.
            c. Soils are probably not conducive to infiltration, but good for stormwater treatments.
            d. Bioswale, green parking lot islands, roof run-off capture – other proposed projects.
            e. Re-do the entire drainage system on site.
        2. Frank DeLeo commented that the area is in a high water table. Erik replied that it was developed in a flood plain so there is not much to be done sub-surface, in terms of infiltration, but sub-surface projects with underdrains, or surface projects such as riparian restoration are still feasible.
    c. Slide 23 – New Haven Adult Ed Center continued
        1. Potential location for GI/LID/stormwater management.
        2. Most catch basins were full of sand from the winter – no street sweeping was done.

d. Slides 24-26 – Defender's Park & Plaza in New Haven
    1. Defender's Park itself has a lot of mature shade trees – we do not want to disrupt the trees or damage roots, so we eliminated the park itself from the list. Instead, we identified two opportunities adjacent to Defender's Park: the large impervious plaza (slide 25) as well as a grass covered traffic triangle (slide 26).
    2. In the Plaza, there are large concrete slabs, and sections of pervious in a checkerboard like pattern planted with small but mature trees (maybe 20-30 years old).. There are also sections of pervious area where there may have been trees previously, but no longer. Otherwise, it is a very large impervious area.
        a. What we do not know is whether this area used for anything—such as farmers markets or other events.
        b. F&O also observed lots of man holes and possible utility issues under ground.
            i. Group comment: plaza was redone after the intersection was redesigned about 20-30 years ago—which is consistent with the estimated age of the trees.
        c. Use this space to treat run-off from adjacent roads.
    3. There is a yard drain/catch basin in the center of the grass-covered traffic triangle, and a landscaping company owns/uses the adjacent parcel.
e. Slide 27-28 Design Concept
    1. For the largely impervious plaza: convert portions of plaza to pervious pavers or pervious surface and replace missing trees. Due to concerns with underground utilities and existing tree roots, F&O proposes the more intensive stormwater controls for the grass strip between the plaza and the road (Davenport Ave and Columbus Ave) rather than in the plaza itself:
        a. The proposal includes 3 bioswales between the road and sidewalk along Davenport and Columbus Avenues., where the overflow from the bioswales would go into existing catch basins.
        b. Add some curb cuts and install a bioswale. The curb cuts will force the water to flow into the bioswale and overflow water will go into the catch basin.
    2. The grass-covered median could be converted to retain stormwater runoff from Davenport Ave and Congress Ave, which could overflow into the yard drain.

f. Slide 29-30 New Haven Bioswale Standard Design
    1. Typical bioswale size is 5 feet deep by 15 feet long. Consists of planted area with trees and plants, engineering soil area, stone layer below, and water infiltrates into the ground; perimeter of bioswale surrounded by decorative fencing.
    2. CFE/Save the Sound managed the installation of a bioswale—a variation on the standard design—on Yale Ave adjacent to the Edgewood School this past December (slide 30).

g. Slide 31 – Ann Street Playground in New Haven

1. Small playground in a residential area – concrete blocks, splash pad, playground. There is little potential on the playground itself, but the area in front of the park along the road is a good location for a bioswale.

h. Slide 32 – Design Concept
    1. Ann Street currently accommodates One-Way traffic with one land of parking on the south side of the street –opposite the playground. To construct a bioswale by the road might require slight bump-out into the road to avoid taking too much of the sidewalk away. This would require extra approval from City of New Haven; such a bump-out may have an added traffic-calming benefit.

i. Slides 33-34 – Monitor Square in New Haven
    1. Monitor Square is a triangular park at the intersection of Chapel, Winthrop, and Derby Avenues.
    2. Has the potential for a larger scale project with multiple elements, but most of the opportunities are in the curb strip surrounding the park rather than in the park itself—due to challenges with elevation changes between the road way and the park.
    3. Striped area of pavement on Chapel –which is not a designated traffic lane—may be a possible location for bioswale (slide 34, bottom image).
j. Slide 35 – Design Concept
    1. Bioswales along the road and in the striped area on Chapel where traffic flow changes – which could be incorporated into the existing grass strip between the road and the sidewalk.
    2. Newly planted trees are in the area – we would have to fit the bioswales between these new trees.
        a. Frank Cochran commented that this intersection floods regularly at the catch basins, so this is a great site if we can intercept that flooding.
k. Slide 36 – another view of potential locations of bioswales at Monitor Square.

l. Slides 37-38– Edgewood School in New Haven
    1. Major problems at this site are large amount of imperviousness (paved play area) that generates stormwater runoff, exposed soil on the slopes abutting the paved area, and subsequently, erosion.
    2. A number of improvements are needed here and the school's staff, administration, and PTA members are interested in redoing the playground.
    3. Current bioswale is located on Yale Avenue, in front of school (see slide 30), and Kendall, on behalf of CFE/Save the Sound, has been working with parents, staff, and administration at the school to educate them about the bioswale and to help them develop solutions to the erosion problem.
m. Slide 39 – Design Concept
    1. Combination of landscaping beds (to restrict foot-traffic access) and land-cover plants to protect the eroded areas.
    2. Bioretention around the catch basins.
    3. Porous pavement on playground. It might be cost-prohibitive to do the entire lot.

4. Rain garden install by down spout.
    a. There are limited opportunities behind the school, so the focus is on the front and the playground.

n. Slide 40 – Hillhouse High School in New Haven
    1. Sprawling campus – parking lots, athletic fields. Many opportunities for on-site and nearby projects.
    2. Much of the area surrounding the school—along Sherman Parkway and Crescent Street—are in the separate storm sewer area. The municipal separate storm sewer system (or MS4 area) discharges into Beaver Ponds on the north side of the school.
o. Slide 41 – Design Concept
    1. Bioswales along Crescent Street and at the intersection of Sherman Pkwy and Munson Street.
    2. Green and/or blue roofs on school –with a focus on sections of roof that are visible from other vantage points within the school. For example, F&O proposes green roofs on single story section of the building that are visible from second/third story windows. Placing green or blue roofs in these areas will have stormwater value as well as educational and outreach benefits.
    3. There is potential to convert portions of pervious grass area to rain gardens by yard drains along the west side of the school
    4. Strategically retrofit parking areas to porous pavement—including the courtyard parking area and parking area for the sports complex
    5. Convert parking island next to sports complex to bioretention area.
        a. Group comments on site: Hillhouse is in a separated area and the stormwater drains into Beaver Ponds. These projects would not target CSO's but would help with stormwater run-off. Frank Cochran mentioned this is a good area for neighbor participation and support. Kathy said Hillhouse has an enthusiastic environmental studies teacher who is active with students on water quality issues and Beaver Ponds – we should include them.

p. Slide 42 – Green/Blue Roof Design
    1. Green roofs use vegetation and blue roofs use stone – to hold water and allow it to evaporate. Blue and green roofs can take on many forms—from modular trays, to extensive (shallow), or intensive (deep) systems.
    2. In general, blue roofs cost less than green roofs and help to mitigate peak stormwater runoff, but slightly less so than green roofs and also lack aesthetic and habitat benefits.
    3. Must evaluate structural/load bearing capacity of a building before installing a green or blue roof because of the added weight of soil, plants, or gravel and water. for these projects
q. Slide 43 – Permeable Pavement
    1. There is a range of products and materials:
        a. Porous asphalt and concrete—similar – but porous asphalt most cost-effective

b. Pervious pavers are more decorative and better suited for small scale applications—such as driveways—where the cost of batching porous asphalt or concrete would be cost prohibitive, but are also widely used in larger scale applications where decorative aspects are valued.
c. Reinforced gravel or grass paving have similar infiltration qualities and rely on a plastic or concrete grid where gravel or grass fills the voids within the grid.
d. Other considerations:
    i. Some porous pavement can be designed for infiltration, others for detention and slow release. The characteristics of the underlying soils and other site conditions will influence whether or not an underdrain is necessary.
    ii. Porous materials must be maintained per specific requirements and are better suited for light traffic areas.
    iii. High-powered vacuum sweepers are needed to clean these pavements – the regular maintenance is a hidden added cost.

r. Slide 44-45 – Notre Dame High School in West Haven
    1. The school is located north of Terrace Avenue and just south of University of New Haven.
    2. The site is within West Haven's municipal separate storm sewer system (MS4) area.
    3. Site is a lot of impervious plots plus maintained lawns.
    4. There are several downspouts connected to the storm sewer and traffic islands that are minimally vegetated, which could be retrofit to capture stormwater.
s. Slide 46 –Design Concept
    1. Bioretention in parking lot islands
    2. Bioretention along building by down spouts.
    3. Infiltration trench at edge of parking lot (stone-filled trench with curb cuts).

t. Slide 47 – Bioretention/Rain Garden Schematic
    1. Designs for rain gardens and Bioretention are site specific, but typical designs include a depression in the landscape with plants, porous soils and, possibly, and underdrain or overflow. The rain garden or Bioretention area fills up during a storm and the water slowly infiltrates into the ground, is soaked up by plants, or evaporates into the atmosphere. Excess water may flow back into the storm sewer via an underdrain or overflow inlet.

u. Slides 48-49 – Pine Rock Fields in Hamden
    1. Athletic fields with small parking areas.
    2. Severe erosion on stream bank – the grass is mowed right up to the river; there are high water flows (evidence by bare soils and high water mark in photo on slide 49), and very little vegetation on stream bank.
v. Slide 50 – Design Concept
    1. This is an excellent location for riparian buffer restoration.

2. There is an area next to the existing parking lot where it appears some early restoration efforts are underway. F&O recommends enhancing this area as well with tree planting.

w. Slides 51-52 – Quigley Field in West Haven
    1. Parking lot and athletic fields.
    2. Massive asphalt plot in poor condition – no green, just asphalt.
    3. Lots of puddles and water pooling in parking lot.
    4. The traffic flow and parking lot lay-out need work; may be a good candidate for re-do of entire parking lot.
        a. Comment: West Haven is economically stressed. We need people from West Haven to consistently be involved in this plan – for all we know, West Haven already has a plan for this site.

x. Slide 53 – Design Concept
    1. This project would be best as a part of an overall site redevelopment project
    2. Do traffic flow study and redesign:
        a. Redefine the parking lot, street edge, entrance and exits.
    3. Incorporate bioretention in parking island and porous asphalt into parking lanes.

y. Slides 54-55 – Forest School in West Haven
    1. Located north of UNH in West Haven
    2. The site has some grass swales around the school that can be converted into water-quality bioswales – an easy retrofit.
    3. Parking areas are in rough shape in some places.

z. Slide 56 – Design Concept
    1. Bioretention next to parking areas.
    2. Convert grass swales to bioretention.
    3. Rain gardens at catch basins in parking lot.
    4. Porous pavement install in parking stalls.

aa. Slides 57-58 – Laurel View Country Club in Hamden
    1. Large parking areas are in rough shape – large impervious plots.
    2. Sections of parking lot are covered in sand and leaves—evidence of heavy sanding in response to winter storms.
    3. Existing access road is steeply sloped, and parking lot and access road drainage is intercepted by storm drains which discharge toward the golf course at the bottom of the access road.
    4. We must confirm the location of the property lines. We believe the park is owned by the City of Hamden, and is, thus, a public parcel, but managed by a private company.

bb. Slide 59-60 – Design Concept
    1. Incorporate bioretention at the two catch basins by the driveway to treat run-off from the parking lot near the top of the existing access road (slide 59).
    2. Proposed gravel wetlands system – capture sediment, remove nutrients, stormwater BMP.

3. Re-do internal drainage of parking lot.
4. Curb-cuts by the catch basins can be added (slide 60)
5. Add bioswale at end of parking lot.

5. NEXT STEPS
    a. F&O to finish GI assessment memo, incorporating each concept with a write-up and rough cost estimate – all to become part of the Watershed Plan. Good potential sites that did not have concepts made will have a description and write-up of proposed plans.
    b. Community workshop meetings to be held Wednesday evenings (May 13, May 27).
        1. 5/13 at Coogan Pavilion (Edgewood Park) – hope to recruit people from SCSU, Bethany, Hamden, Westville; 5/27 at Barnard Nature Center – hope to recruit people from lower watershed and West Haven.
        2. STS will advertise community meetings with press releases as well as Constant Contact blasts. Steering Committee should contact anyone they know to advertise the meetings. Someone should contact SCSU and UNH – please let Kendall know who to contact.
    c. Stream walks with assessment training to be done by F&O. Assessment per EPA/NRCS guidelines – identify outfalls, erosion, etc.
        1. These walks can lead to other projects in the watershed, offer good educational value, and are a good volunteer activity.
        2. Common Ground High School has funding to participate in some stream assessments.
    d. Draft Watershed Plan will be completed after the Community workshop meetings, end of June.
    e. Final Watershed Plan should be complete by the end of August.
6. GROUP COMMENTS
    a. Questions about SCSU and their stormwater plans. Lynne said their master plan can be downloaded from their website. Erik said SCSU plans state recommendations for LID implementation for all new building construction or renovation. DCS is responsible for making sure SCSU follows their plan and Erik has a contact in Hartford there. Also some comments on involving people from SCSU in this process (Sustainability office? Facilities?)
    b. Comments about need for having a system to archive all of the stream assessment data, not just from this project but from other groups who have done them in the past. Past stream assessment data was included in Technical Memo #1 by F&O. Perhaps West River Watershed Coalition can have some sort of storage or database for this information. WRWC does not have the capacity or funds to do this right now, though. Chris Malik said quality assurance protocols should be in place for consistency of reporting – then perhaps some state or federal funding can be requested.
    c. Mike Dietz at UCONN received funding to help to regulation assessment in watersheds for LID and the West River Watershed was one of the watersheds chosen for this project. Their goal is to look at regulations, assess them, and work with municipalities to update regulations. Request to invite Mike Dietz to next WRWC meeting.
    d. Residential projects vs. municipal/public projects? Erik said a huge piece of this plan is recommendations for homeowners and smaller scale projects. Participation of homeowners is higher with incentive programs, but we do not have a constant funding source to have any incentives – may not be as effective.

West River Watershed Management Plan

Appendix E: Community Workshop Meeting Summaries

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOPS

May 13th 6:30-8:30pm

@ the Edgewood Park **COOGAN PAVILION**

OR

May 27th 6:30-8:30pm

@ the West River Memorial Park **BARNARD NATURE CENTER**

THE WEST RIVER runs 25 miles from the forests of Bethany and Woodbridge through the urbanized expanses of New Haven and West Haven to the Long Island Sound. While the river is only 25 miles long, the WEST RIVER WATERSHED covers over 34 square miles of land, including parts of Hamden—all of which drains to the river over land or through its many tributaries.

JOIN US for one of two workshops focused on water quality in the WEST RIVER. Learn about the WEST RIVER WATERSHED PLAN and the connection between land use and water quality. Help us to identify solutions to pollution in the river and its tributaries.

YOUR KNOWLEDGE and suggestions for improving the WEST RIVER are vital to developing a successful watershed plan.

Free and open to the public
Your participation highly encouraged

For Questions and RSVP contact:
kbarbery@savethesound.org

The WEST RIVER WATERSHED COMMUNITY WORKSHOP #1
MAY 13, 2015

The number before the topic is how many stickers it received from meeting attendees

MAIN CONCERNS

7 Catalog open space land and prioritize lands to protect
6 Habitat restoration
6 Consistency and availability of water quality data and enforcement
5 Outreach to high-impact, low-interaction populations
4 Stakeholder buy-in (DOT)
3 Regulations for riparian development
3 Restore uses
2 Safe place for grandchildren
2 Maintenance
2 Access, awareness, water quality, stewardship
1 Drinking water protection
1 Control of geese

OUTCOMES

7 A swimmable lower river and recreation
6 Access to river – pedestrian access
5 Restore fishery to reservoir
5 Management of runoff from Route 15 to Belden Brook
5 Basis for seeking funding, education, outreach, engagement
4 Enlist political representatives
3 What is required to get to zero pollution/CSO/runoff?
3 Identify and preserve wildlife habitat
3 Understanding of stewardship
2 Community engagement – What can I/ you do?
2 Plan to network with overlapping organizations, town groups, etc.
1 No additions to CSO – new projects process water on site
0 Funding

PROJECT RECOMMENDATIONS

13 Incentives for private property owners for GI retrofits
7 Use GI to eliminate stormwater runoff
5 Bring in SCSU
4 Provide mechanism of support for a full-time watershed coordinator
3 Composting – yard waste
3 Consistent support for West River Water Festival
3 Central database
3 More hikes, walks, float trips

3	Dealing with animal waste (New Haven and Woodbridge animal shelters on Beaver Ponds and Konolds Pond)
2	Bring in DOT
1	Removal of large trash from river
1	Preserve the “narrows” between West Rock and Pond Lily
1	Invasives removal
1	Volunteer stewards for specific projects (“adopt a swale”)
0	Use “low-hanging fruit” to get people involved
0	Habitat restoration – riparian
0	West River “Rivers Alliance” Group
0	Invite participants to coalition meetings

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

open space catalogue & targets for permanent preservation
protection of drinking water lands

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

recreation opportunities to get people to understand

3. Do you have any specific project ideas or recommendations for your area of the watershed?

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

Diverting NPS + CSOs from River

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

More mitigation of NPS flows, especially stormwater outflows into W.R.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

All the stormwater outfalls in the W.R.

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?
   Water quality & recreation

2. What would you most like to see as outcomes of the West River Watershed Management Plan?
   More green infrastructure projects

3. Do you have any specific project ideas or recommendations for your area of the watershed?
   I would like to see demonstration projects in Westville to educate the public.

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?
   Water quality - riparian zone degradation

2. What would you most like to see as outcomes of the West River Watershed Management Plan?
   Fishable swimmable water. Enhanced public awareness of the value of WQ restoration.

3. Do you have any specific project ideas or recommendations for your area of the watershed?
   Enhanced cooperation between GNHWPCA and private property owners to provide incentives for stormwater mitigation on private property and roof leader disconnection → infiltration where feasible

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   WHAT IS BEING DONE TO IMPROVE THE AQUATIC LIFE OF THE WEST RIVER

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   WE WOULD LIKE TO SEE INPAIRMENT REMOVED SO THAT RIVER COULD BE USED FOR RECREATION SWIMING, FISHING WITH HIKING TRAILS

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   EXEND EXISTING TRAILS ALONG THE RIVER. HAVE YOUTH GROUPS DO CLEAN UP PROJECTS. HAVE THE RIVER STOCK WITH FISH.

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   I Came to find out what it was about.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   Ø fecal coliform
   greenway & habitat

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   —

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

That runoff from storm sewers be separated from waste sewage

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

A West River that is high quality, non-polluted as it runs through Westville & makes its way through Edgewood Park, West Haven & the Sound

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Greater public awareness through schools, Chamber, & other community organizations of the problems & plans to solve them

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

Site Development - New Construction + compliance with current regulations - Limit new construction where runoff cannot be controlled

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

No additions to CSO and all new projects required to process water on site or to designated infiltration, detention area

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Zoning changes

Remove obstacles to fish
Restore banks + revegetate -
} Monitor Areas for illegal runoff + correct

Require Storm Water Plans for new projects before allow construction -

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

current degraded areas

Degraded areas get remediated
Public become aware of issues (education) and work toward restoration & preservation of watershed – i.e., that it becomes a whole-community effort

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Involve congregational "Green Teams" in the area

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

How will any changes/improvements be maintained over time?

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

recreation opportunities along areas below Pond Lily to Source
protection/restoration of wildlife habitats

3. Do you have any specific project ideas or recommendations for your area of the watershed?

How does Amity Animal Shelter ~~feces~~ handle fecal waste?

Volunteer monitors/stewards for specific spots or projects going forward for litter control data collection, plant maintenance (invasive removal and notification to proper authorities

Is any previous invasives

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

Water Quality, responsible development

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

Energize community to partner on improving water quality, especially in residential areas

3. Do you have any specific project ideas or recommendations for your area of the watershed?

More green infrastructure
more green infrastructure
more green infrastructure
eliminate CSOs

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

Pollution issues in New Haven, improving habitat & water quality in Lower Watershed

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

Water quality that allows high quality recreational use along entire river-way, better wildlife habitat all along length, and education so people enjoy and protect both.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Focus on education/outreach at least as much as infrastructure; if 51% of pollutants are NPS, education is best way to reduce impacts. Use schools, scout groups, etc. Renew the "water drop" scout patch!

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

SE SW? other large stakeholder Buy in

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

Fishable, Swimmable West River (edible?)

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Enhance WATER recreational opportunities for lower W.R. W.S.
Increase Support for W.R. Waterfest Festival

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

1. How to reduce the "random poop" (geese etc) component
2. How to create infiltration system for state highways - particularly the Wilbur Gross Pkwy + Routes 10 + 34.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

A set of recommended actions that would induce DEEP to change categorization as impaired for recreation
A completed trail from Rte 1 to Bethany
Restored fishery

3. Do you have any specific project ideas or recommendations for your area of the watershed?

d) Use of silted areas for stream bank restoration ~~via~~ (~~very small scale~~
b) Eliminate the CSO outlet at Whalley Ave - includes reduction of storm water ~~infiltration~~ discharges.

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?
Access, Water Quality, Awareness + Stewardship
Habitat Restoration, Recreation Opportunities

2. What would you most like to see as outcomes of the West River Watershed Management Plan? A basis for seeking funding not only for identified potential projects (GI) but also for signage, residential workshops, and resident/business/community engagement efforts on an on-going basis. Not just stormwater management but also other aspects like recreation + habitat

3. Do you have any specific project ideas or recommendations for your area of the watershed?
Preserve Narrows/Increased recreational use along Narrows to raise public awareness; workshops with gardeners: Newhaven Garden Club, New Haven Land Trust and any other garden groups. Invasives removal + Natives Planting @ Bowling Green Park Brings Southern -

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WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

if you have any questions -
Scott Bishop
scootermcb@gmail.com
(203) 361-1076

1. What are your main concerns regarding the West River and its watershed?
Cleanliness of water/water quality
Consistancy of water quality data and easy availability to the public
Enforcement of standards

2. What would you most like to see as outcomes of the West River Watershed Management Plan? Increased monitering and public availability of water quality data
Better enforcement of existing requirements regarding new construction a re development
Increased monitoring of construction/development sites
Better management of runoff from Rt 15 ⇒ Belden Brook

3. Do you have any specific project ideas or recommendations for your area of the watershed? Establishment of a central database online where data on water quality (daily or weekly) is available
Better Identification of NPS runoff
Enhanced Flood management

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Pollution/soil erosion/run-off

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   more community involvement
   better water Quality
   Educational opportunities for civilians like this one!

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   Shelterbelts
   mulching/composting of grass + leaves
   "Cleanups"
   community involvement

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Low awareness as to State of water shed

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   Restoration of water quality levels to
   Support more recreational activities

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   Large trash removal projects that focus
   on removal of items like Shopping carts, tires, etc.

WEST RIVER WATERSHED COMMUNITY WORKSHOP #2
MAY 27, 2015

The number before the topic is how many stickers it received from meeting attendees

MAIN CONCERNS

7	Quality of education and employment opportunities and community building
6	Access
4	Run-off
3	CSO's
3	No central place for watershed data
2	Clean water
2	Getting support for the watershed plan
2	Lack of stewardship by people living along river and in homeless camps
2	Marketing – community buy-in
2	Lack of coordination between watershed towns
2	Achievable goals (within our lifetime!)
1	Illicit sources
1	Knotweed/invasive plants
1	Reduced base flow because of impervious surface – no infiltration
1	Lack of wildlife habitat
0	Industrial pollution in the lower watershed
0	Modeled versus measured results

OUTCOMES

7	Clean(er) water
6	Active public engagement
5	Address incentives for residential green practices
4	Paddleboat/swimming/recreation areas
3	Crosswalks
3	More education/outreach
3	Further implementation of bioswales and rain gardens
3	Scalable green infrastructure
3	Increase access – Boulevard in particular
2	Plan include projects/recommendations with multiple benefits (access, water quality, habitat, education, …)
2	Neighborhood outreach that includes tax-free residents and homeless
2	Improve sport fishing
1	Access for recreation
1	Restoring river to recreational standards
1	Replace West River Memorial Park boulders
0	Behavior change
0	Stronger regulatory enforcement/incentives to get this work done
0	Municipal endorsement and commitment to obtaining goals

PROJECT RECOMMENDATIONS

8	Access Access Access
7	Create clear steps everyone can take
6	Help the community organize its neighbors
4	Incorporate GI into all Route 34 planning
4	More signage and information for visitors at access points
3	Prioritize/target CSO elimination (Legion & Derby Ave)
3	Marginal Drive “High Line”
3	Fix broken foot bridge in the “narrows” (by Amrhyn Field at West Rock)
2	Reclaim Wintergreen Brook
1	Remove tree blocking the flow/recreational access
1	More people in the river in canoes
1	Education about natural gardening
1	Access to resources/funding
1	Understand impairments in tributaries – Wintergreen Brook

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Swan Boats
Yachts for Homeless
Wading Puddles

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

damn the dams! (guess who ☺)
mitigate CSOs, restore buffers, restore fish + wildlife

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

repeatable, low cost green infrastructure solutions
(buffer protection + green infra. / buffer projects.
phrag control.)

3. Do you have any specific project ideas or recommendations for your area of the watershed?

engagement w/ youth + community groups
for stewardship and job creation.

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Water quality in Edgewood Park and face of West Rock
   Access

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   water that's clean enough to wade in safely

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   Edgewood School is already working on a "Schoolyard Habitat" project that addresses some of the erosion issues along Edgewood Ave. You might coordinate with them...

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Homeless Population living along the WR, Urban Communities that litter in the WR because they don't understand the value of the River

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   access for recreation, Safe walking trails, Community Education

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   Help communities along the WR develop Stewardship of the River, Help Community create plan for easy fixes and future development

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Pollution from the quantity of stormwater runoff due to CSO and NPS pollution. Also would like to see greater education of residents in the watershed.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   Small scale GI recommendations that are scalable to other areas, or to begin thinking about a greater financial + political commitment to watershed management. Also fun, educational opportunities to engage residents + foster resiliency and ultimately create behavior change. How to make people care.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   Small scale GI projects seem to be working thus far - would recommend continuing to involve residents, students, communities to maintain + steward locations in long term.

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Poor water quality and difficult access to River. One They work together to make community involvement difficult

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   A clear plan that helps prioritize steps (and provide alternatives) for improving water quality in the River.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   More community outreach to locally neighborhoods — Use projects to educate and involve neighborhood on ways to improve (or impact) the water quality.

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

I'm mainly concerned with the failures of the West River watershed to support aquatic life, esp. spawning fish.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

More fish habitat!

And more community engagement

3. Do you have any specific project ideas or recommendations for your area of the watershed?

Check out the work of Filtrexx International

Also thinking about how climate change might influence the watershed, and how we might adapt, could be powerful for community members

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

Clean water suitable for recreational use - We asked for a watershed based plan to reduce CSOs and improve water quality - we would like to extend this success to other parts of the city.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

active public engagement from homeowners in reducing stormwater runoff to save money from more expensive solutions proposed by the sewer plant, such as spending millions of dollars on a new sewer plant primary treatment talk.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

door to door outreach in the West River Neighborhood services area (lower West River watershed) taking inventory of those still connected to sewer system and beginning to record community information in a central data base that the city of New Haven may supply.

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

- Water Quality and • Improved access
- Marketing the Resource • Fishing

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

Same as above + • More Low Impact Design Projects

- Place for Data & Public access to the Data

3. Do you have any specific project ideas or recommendations for your area of the watershed?

- Training for and Water quality monitoring by local community groups and schools
- Boardwalk – "High Line" type like NYC did

WEST RIVER WATERSHED PLAN
COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

- Creating opportunities for employment, community building and public access connected to water
- Enacting the improvement declared Recreation designation

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

Make green infrastructure investments that improve water quality and public access / quality of life / health simultaneously. Prioritize projects that do both

3. Do you have any specific project ideas or recommendations for your area of the watershed?

We need a plan for reclaiming Winterglen Brook as a public resource, while also addressing impaired water quality there

WEST RIVER WATERSHED PLAN

COMMUNITY WORKSHOP

1. What are your main concerns regarding the West River and its watershed?

   Essentially water quality and how West River's water quality affects surrounding life.

2. What would you most like to see as outcomes of the West River Watershed Management Plan?

   More natural water quality, meaning water that have little to no signs of being affected by the surrounding area.

3. Do you have any specific project ideas or recommendations for your area of the watershed?

   At the moment no.

West River Watershed Management Plan

Appendix G: Pollutant Load Reduction Model Results

Anticipated Annual Pollutant Load Reductions

Watershed Management Recommendation	TN (lb/yr)	TP (lb/yr)	TSS (lb/yr)	FC (billion/yr)	Runoff Volume (acre-feet/year)
CSO Abatement (2036 Condition)	2,529	241	18,062	548,800	-
Green Infrastructure (10% of impervious area)	16,286	1,509	455,653	70,974	801
Riparian Buffer Restoration	2,307	320	50,581	10,996	181
Reforestation	13,536	1,693	542,411	49,513	871
Public Education	1,382	180	-	12,018	-
Illicit Discharge Detection and Elimination (IDDE)	306	120	2,491	126,561	-
Septic Repair	362	60	2,416	6,991	-
Total	36,709	4,124	1,071,615	825,852	1,854

Summary of Modeled Pollutant Loads and Load Reductions -- West River

	Natural Background Conditions	Existing Conditions	Future Conditions	Load Reductions (From Existing Conditions)	Effective Load Reductions (Accounting for Natural Background Loads)
Nitrogen (lb/yr)	22,028	331,081	294,371	11.1%	11.9%
Phosphorus (lb/yr)	1,544	37,090	32,966	11.1%	11.6%
TSS (lb/yr)	577,870	13,725,520	12,653,905	7.8%	8.2%
Fecal Coliform (billion/yr)	16,475	2,667,974	1,842,122	31.0%	31.1%
Runoff Volume (acre-ft/year)	2,666	21,509	19,655	8.6%	9.8%

Nitrogen Load Reductions with Watershed Management Recommendations

		Future Conditions Loads (lb/yr)						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	30,226	30,226	28,328	30,173	24,782	29,927	30,168	30,226
Belden Brook Subwatershed	19,584	19,584	18,908	19,252	16,851	19,553	19,581	19,559
Lower West River Subwatershed	102,481	99,952	96,451	101,884	97,122	101,674	102,289	102,481
Middle West River Subwatershed	49,160	49,160	47,095	48,912	49,160	49,132	49,136	49,061
Sargent River Subwatershed	37,589	37,589	35,977	37,477	37,589	37,573	37,589	37,469
Upper West River	20,078	20,078	19,440	20,063	20,078	20,069	20,078	20,007
Wilmot Brook Subwatershed	58,869	58,869	56,158	58,004	58,869	58,720	58,852	58,869
Wintergreen Brook Subwatershed	13,093	13,093	12,436	13,008	13,093	13,049	13,082	13,046
Watershed Total at West River Outlet	331,081	328,552	314,794	328,773	317,544	329,699	330,775	330,718

		% Load Reductions						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	30,226	0.0%	6.3%	0.2%	18.0%	1.0%	0.2%	0.0%
Belden Brook Subwatershed	19,584	0.0%	3.5%	1.7%	14.0%	0.2%	0.0%	0.1%
Lower West River Subwatershed	102,481	2.5%	5.9%	0.6%	5.2%	0.8%	0.2%	0.0%
Middle West River Subwatershed	49,160	0.0%	4.2%	0.5%	0.0%	0.1%	0.0%	0.2%
Sargent River Subwatershed	37,589	0.0%	4.3%	0.3%	0.0%	0.0%	0.0%	0.3%
Upper West River	20,078	0.0%	3.2%	0.1%	0.0%	0.0%	0.0%	0.4%
Wilmot Brook Subwatershed	58,869	0.0%	4.6%	1.5%	0.0%	0.3%	0.0%	0.0%
Wintergreen Brook Subwatershed	13,093	0.0%	5.0%	0.6%	0.0%	0.3%	0.1%	0.4%
Watershed Total at West River Outlet	331,081	0.8%	4.9%	0.7%	4.1%	0.4%	0.1%	0.1%

Phosphorus Load Reductions with Watershed Management Recommendations

		Future Conditions Loads (lb/yr)						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	4,191	4,191	3,975	4,183	3,443	4,152	4,171	4,191
Belden Brook Subwatershed	1,707	1,707	1,661	1,672	1,468	1,703	1,706	1,703
Lower West River Subwatershed	13,530	13,289	12,889	13,439	12,825	13,425	13,451	13,530
Middle West River Subwatershed	4,002	4,002	3,888	3,977	4,002	3,999	3,989	3,986
Sargent River Subwatershed	2,949	2,949	2,859	2,937	2,949	2,947	2,949	2,929
Upper West River	1,818	1,818	1,771	1,816	1,818	1,817	1,818	1,806
Wilmot Brook Subwatershed	7,315	7,315	7,026	7,182	7,315	7,296	7,312	7,315
Wintergreen Brook Subwatershed	1,577	1,577	1,511	1,565	1,577	1,571	1,574	1,569
Watershed Total at West River Outlet	37,090	36,849	35,581	36,770	35,397	36,910	36,970	37,030

		% Load Reductions						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	4,191	0.0%	5.2%	0.2%	17.9%	0.9%	0.5%	0.0%
Belden Brook Subwatershed	1,707	0.0%	2.7%	2.1%	14.0%	0.2%	0.0%	0.2%
Lower West River Subwatershed	13,530	1.8%	4.7%	0.7%	5.2%	0.8%	0.6%	0.0%
Middle West River Subwatershed	4,002	0.0%	2.9%	0.6%	0.0%	0.1%	0.3%	0.4%
Sargent River Subwatershed	2,949	0.0%	3.0%	0.4%	0.0%	0.1%	0.0%	0.7%
Upper West River	1,818	0.0%	2.6%	0.1%	0.0%	0.1%	0.0%	0.6%
Wilmot Brook Subwatershed	7,315	0.0%	4.0%	1.8%	0.0%	0.3%	0.0%	0.0%
Wintergreen Brook Subwatershed	1,577	0.0%	4.2%	0.8%	0.0%	0.4%	0.2%	0.5%
Watershed Total at West River Outlet	37,090	0.6%	4.1%	0.9%	4.6%	0.5%	0.3%	0.2%

TSS Load Reductions with Watershed Management Recommendations

		Future Conditions Loads (lb/yr)						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	1,483,065	1,483,065	1,431,662	1,481,900	1,264,275	1,483,065	1,482,605	1,483,065
Belden Brook Subwatershed	811,661	811,661	792,335	805,729	714,917	811,661	811,636	811,492
Lower West River Subwatershed	4,283,206	4,265,144	4,105,990	4,266,687	4,056,330	4,283,206	4,281,619	4,283,206
Middle West River Subwatershed	2,003,824	2,003,824	1,939,618	1,998,527	2,003,824	2,003,824	2,003,602	2,003,159
Sargent River Subwatershed	1,432,558	1,432,558	1,388,699	1,430,440	1,432,558	1,432,558	1,432,558	1,431,761
Upper West River	699,478	699,478	683,667	699,180	699,478	699,478	699,478	699,005
Wilmot Brook Subwatershed	2,334,360	2,334,360	2,271,744	2,317,073	2,334,360	2,334,360	2,334,242	2,334,360
Wintergreen Brook Subwatershed	677,368	677,368	656,153	675,402	677,368	677,368	677,290	677,054
Watershed Total at West River Outlet	13,725,520	13,707,458	13,269,867	13,674,939	13,183,109	13,725,520	13,723,029	13,723,104

		% Load Reductions						
Subwatershed	Existing Conditions (lb/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	1,483,065	0.0%	3.5%	0.1%	14.8%	0.0%	0.0%	0.0%
Belden Brook Subwatershed	811,661	0.0%	2.4%	0.7%	11.9%	0.0%	0.0%	0.0%
Lower West River Subwatershed	4,283,206	0.4%	4.1%	0.4%	5.3%	0.0%	0.0%	0.0%
Middle West River Subwatershed	2,003,824	0.0%	3.2%	0.3%	0.0%	0.0%	0.0%	0.0%
Sargent River Subwatershed	1,432,558	0.0%	3.1%	0.1%	0.0%	0.0%	0.0%	0.1%
Upper West River	699,478	0.0%	2.3%	0.0%	0.0%	0.0%	0.0%	0.1%
Wilmot Brook Subwatershed	2,334,360	0.0%	2.7%	0.7%	0.0%	0.0%	0.0%	0.0%
Wintergreen Brook Subwatershed	677,368	0.0%	3.1%	0.3%	0.0%	0.0%	0.0%	0.0%
Watershed Total at West River Outlet	13,725,520	0.1%	3.3%	0.4%	4.0%	0.0%	0.0%	0.0%

Fecal Coliform Load Reductions with Watershed Management Recommendations

		Future Conditions Loads (billion/yr)						
Subwatershed	Existing Conditions (billion/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	294,177	294,177	286,656	293,931	274,561	291,578	265,848	294,177
Belden Brook Subwatershed	103,694	103,694	100,215	102,151	91,878	103,424	101,018	102,840
Lower West River Subwatershed	1,378,944	830,144	1,356,305	1,376,420	1,360,863	1,371,925	1,305,973	1,378,944
Middle West River Subwatershed	246,929	246,929	235,879	245,734	246,929	246,685	242,076	244,710
Sargent River Subwatershed	157,592	157,592	149,720	157,089	157,592	157,453	157,592	155,696
Upper West River	96,576	96,576	92,438	96,478	96,576	96,501	96,576	95,815
Wilmot Brook Subwatershed	307,705	307,705	296,077	303,144	307,705	306,408	295,575	307,705
Wintergreen Brook Subwatershed	82,358	82,358	79,710	82,030	82,358	81,981	76,755	81,097
Watershed Total at West River Outlet	2,667,974	2,119,174	2,597,000	2,656,978	2,618,461	2,655,956	2,541,413	2,660,983

		% Load Reductions						
Subwatershed	Existing Conditions (billion/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	294,177	0.0%	2.6%	0.1%	6.7%	0.9%	9.6%	0.0%
Belden Brook Subwatershed	103,694	0.0%	3.4%	1.5%	11.4%	0.3%	2.6%	0.8%
Lower West River Subwatershed	1,378,944	39.8%	1.6%	0.2%	1.3%	0.5%	5.3%	0.0%
Middle West River Subwatershed	246,929	0.0%	4.5%	0.5%	0.0%	0.1%	2.0%	0.9%
Sargent River Subwatershed	157,592	0.0%	5.0%	0.3%	0.0%	0.1%	0.0%	1.2%
Upper West River	96,576	0.0%	4.3%	0.1%	0.0%	0.1%	0.0%	0.8%
Wilmot Brook Subwatershed	307,705	0.0%	3.8%	1.5%	0.0%	0.4%	3.9%	0.0%
Wintergreen Brook Subwatershed	82,358	0.0%	3.2%	0.4%	0.0%	0.5%	6.8%	1.5%
Watershed Total at West River Outlet	2,667,974	20.6%	2.7%	0.4%	1.9%	0.5%	4.7%	0.3%

Runoff Volume Reductions with Watershed Management Recommendations

		Future Conditions Loads (acre-feet/yr)						
Subwatershed	Existing Conditions (acre-ft/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	1,986	1,986	1,887	1,981	1,632	1,986	1,986	1,986
Belden Brook Subwatershed	1,148	1,148	1,122	1,127	997	1,148	1,148	1,148
Lower West River Subwatershed	6,973	6,973	6,652	6,919	6,606	6,973	6,973	6,973
Middle West River Subwatershed	3,230	3,230	3,138	3,212	3,230	3,230	3,230	3,230
Sargent River Subwatershed	2,529	2,529	2,452	2,521	2,529	2,529	2,529	2,529
Upper West River	1,344	1,344	1,311	1,342	1,344	1,344	1,344	1,344
Wilmot Brook Subwatershed	3,267	3,267	3,149	3,202	3,267	3,267	3,267	3,267
Wintergreen Brook Subwatershed	1,031	1,031	996	1,024	1,031	1,031	1,031	1,031
Watershed Total at West River Outlet	21,509	21,509	20,707	21,328	20,637	21,509	21,509	21,509

		% Load Reductions						
Subwatershed	Existing Conditions (acre-ft/yr)	CSO Abatement (2036 levels)	Green Infrastructure (10% of impervious area)	Riparian Buffer Restoration	Reforestation	Public Education	Illicit Discharge Detection and Elimination (IDDE)	Septic Repair
Beaver Brook Subwatershed	1,986	0.0%	5.0%	0.2%	17.8%	0.0%	0.0%	0.0%
Belden Brook Subwatershed	1,148	0.0%	2.2%	1.9%	13.1%	0.0%	0.0%	0.0%
Lower West River Subwatershed	6,973	0.0%	4.6%	0.8%	5.3%	0.0%	0.0%	0.0%
Middle West River Subwatershed	3,230	0.0%	2.8%	0.6%	0.0%	0.0%	0.0%	0.0%
Sargent River Subwatershed	2,529	0.0%	3.0%	0.3%	0.0%	0.0%	0.0%	0.0%
Upper West River	1,344	0.0%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%
Wilmot Brook Subwatershed	3,267	0.0%	3.6%	2.0%	0.0%	0.0%	0.0%	0.0%
Wintergreen Brook Subwatershed	1,031	0.0%	3.4%	0.7%	0.0%	0.0%	0.0%	0.0%
Watershed Total at West River Outlet	21,509	0.0%	3.7%	0.8%	4.1%	0.0%	0.0%	0.0%

West River Watershed Management Plan

Appendix H: Potential Funding Sources

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West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
EPA and WEF National Municipal Stormwater and Green Infrastructure Awards Program	The National Municipal Stormwater and Green Infrastructure Awards program, led by the Water Environment Federation (WEF) through a cooperative agreement with the U.S. Environmental Protection Agency (EPA), has been established to recognize high-performing regulated Municipal Separate Stormwater Sewer Programs (MS4s). The objective of the program is to inspire MS4 program leaders to seek new and innovative ways to meet and exceed regulatory requirements in a manner that is both technically effective as well as financially efficient. Recognition of innovative approaches is also a highlight of this program.	http://www.wef.org/ms4awards/
EPA Urban Waters Small Grants Program	Funds research, investigations, experiments, training, surveys, studies, and demonstrations that will advance the restoration of urban waters by improving water quality through activities that also support community revitalization and other local priorities. Projects proposed for funding must take place entirely within and focus on specific Eligible Geographic Areas.	http://www2.epa.gov/urbanwaters/urban-waters-small-grants
EPA Healthy Communities Grant Program	EPA New England's main competitive grant program to work directly with communities to reduce environmental risks to protect and improve human health and the quality of life.	http://www.epa.gov/region1/eco/uep/hcgp.html
EPA Environmental Education Grants	The Grants Program sponsored by EPA's Office of Environmental Education (OEE), Office of External Affairs and Environmental Education, supports environmental education projects that enhance the public's awareness, knowledge, and skills to help people make informed decisions that affect environmental quality.	http://www.epa.gov/enviroed/grants.html
EPA Five Star Restoration Grant Program	The Five Star Restoration Program brings together students, conservation corps, other youth groups, citizen groups, corporations, landowners and government agencies to provide environmental education and training through projects that restore wetlands and streams. The program provides challenge grants, technical support and opportunities for information exchange to enable community-based restoration projects.	http://www.epa.gov/owow/wetlands/restore/5star/

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Funding Source	Description	Reference
Partnership for Sustainable Communities	The U.S. Department of Housing and Urban Development (HUD), U.S. Department of Transportation (DOT), and the U.S. Environmental Protection Agency (EPA) work together to help communities nationwide improve access to affordable housing, increase transportation options, and lower transportation costs while protecting the environment. The site's map of grants shows information on awards already made through Partnership programs.	http://www.sustainablecommunities.gov/partnership-resources
FEMA (Federal Emergency Management Agency) Preparedness (Non-Disaster) Grants	FEMA provides state and local governments with preparedness program funding to enhance the capacity of their emergency responders to prevent, respond to, and recover from a range of hazards.	http://www.fema.gov/preparedness-non-disaster-grants
FEMA Hazard Mitigation Assistance	FEMA's Hazard Mitigation Assistance grant programs provide funding to protect life and property from future natural disasters. • Hazard Mitigation Grant Program (HMGP) assists in implementing long-term hazard mitigation measures following a major disaster. • Pre-Disaster Mitigation (PDM) provides funds for hazard mitigation planning and projects on an annual basis. • Flood Mitigation Assistance (FMA) provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the National Flood Insurance Program (NFIP) on an annual basis.	http://www.fema.gov/hazard-mitigation-assistance
United States Fish and Wildlife Service (USFWS)	The USFWS administers a variety of natural resource assistance grants to governmental, public and private organizations, groups and individuals.	http://www.fws.gov/grants/

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Funding Source	Description	Reference
USFWS North American Wetlands Conservation Act (NAWCA)	NAWCA provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico for the benefit of wetlands-associated migratory birds and other wildlife.	http://www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm
USFWS Partners for Fish and Wildlife Program	The Partners Program provides technical and financial assistance to private landowners and Tribes who are willing to work with USFWS and other partners on a voluntary basis to help meet the habitat needs of Federal Trust Species. The Partners Program can assist with projects in all habitat types which conserve or restore native vegetation, hydrology, and soils associated with imperiled ecosystems such as longleaf pine, bottomland hardwoods, tropical forests, native prairies, marshes, rivers and streams, or otherwise provide an important habitat requisite for a rare, declining or protected species.	http://www.fws.gov/partners/
USFWS National Coastal Wetlands Conservation Grant Program	The NCWCGP provides States with financial assistance to protect and restore these valuable resources. Projects can include (1) acquisition of a real property interest (e.g., conservation easement or fee title) in coastal lands or waters (coastal wetlands ecosystems) from willing sellers or partners for long-term conservation or (2) restoration, enhancement, or management of coastal wetlands ecosystems. All projects must ensure long-term conservation.	http://www.fws.gov/coastal/coastalgrants/
USFS Watershed and Clean Water Action and Forestry Innovation Grants	This effort between USDA FS-Northeastern Area and State Foresters is to implement a challenge grant program to promote watershed health through support of state and local restoration and protection efforts.	http://www.na.fs.fed.us/watershed/gp_innovation.shtm
Department of Commerce: National Oceanic and Atmospheric Administration	A variety of grant programs associated with the NOAA's strategic plan and mission goals including climate-related projects and regional resilience grants.	http://www.cpo.noaa.gov/ClimatePrograms.aspx http://www.coast.noaa.gov/resilience-grant

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
NRCS Conservation Stewardship Program	This program is available to producers to address resource concerns in a comprehensive manner by improving existing conservation activities and undertaking new conservation activities.	http://www.nrcs.usda.gov/programs/csp/
NRCS Conservation Reserve Program	This program is to provide technical and financial assistance to eligible farmers to address soil, water, and related natural resource concerns on their lands in an environmentally-beneficial and cost-effective manner.	http://www.nrcs.usda.gov/programs/crp/
NRCS Emergency Watershed Protection (EWP) Program	The Emergency Watershed Protection (EWP) Program is designed to help people and conserve natural resources by relieving imminent hazards to life and property caused by floods, fires, wind-storms, and other natural occurrences. EWP is an emergency recovery program.which responds to emergencies created by natural disasters. It is not necessary for a national emergency to be declared for an area to be eligible for assistance. EWP is designed for installation of recovery measures. Activities include providing financial and technical assistance to remove debris from stream channels, road culverts, and bridges, reshape and protect eroded banks, correct damaged drainage facilities, establish cover on critically eroding lands, repair levees and structures, and repair conservation practices.	http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
NRCS Floodplain Easement Program	NRCS is providing up to $124.8 million in Emergency Watershed Protection Program-Floodplain Easement funding to help prevent damages from future storm events in Connecticut and other states affected by Hurricane Sandy. NRCS purchases the permanent easements on eligible lands and restores the area to natural conditions. The program complements traditional disaster recovery funding and allows NRCS to purchase a permanent easement on lands within floodplains that sustained damage from Sandy.	http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ct/home/?cid=stelprdb1143958
NRCS Wildlife Habitat Incentives Program (WHIP)	For creation, enhancement, maintenance of wildlife habitat; for privately owned lands.	http://www.nrcs.usda.gov/programs/whip/

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
NRCS Environmental Quality Incentives Program (EQIP)	For implementation of conservation measures on agricultural lands.	http://www.ct.nrcs.usda.gov/programs/eqip/eqip.html
NRCS Healthy Forests Reserve Program	For restoring and enhancing forest ecosystems	http://www.nrcs.usda.gov/programs/hfrp/proginfo/index.html
NRCS Wetlands Reserve Program	For protection, restoration and enhancement of wetlands	http://www.nrcs.usda.gov/programs/wrp/
U.S. Department of Housing and Urban Development (HUD)	The Community Development Block Grant (CDBG) program is a flexible program that works to ensure decent affordable housing, provide services to the most vulnerable in our communities, and create jobs through the expansion and retention of businesses. CDBG-financed projects could incorporate green infrastructure into their design and construction. The Disaster Relief Appropriations Act of 2013 (Pub. L. 113–2) allocated $5,400,000,000 of Community Development Block Grant disaster recovery (CDBG–DR) funds for the purpose of assisting recovery in the most impacted and distressed areas declared a major disaster due to Superstorm Sandy HUD's Sustainable Communities Regional Planning Grant Program supports metropolitan and multijurisdictional planning efforts that integrate housing, land use, economic and workforce development, transportation, and infrastructure investments in a manner that empowers jurisdictions to consider the interdependent challenges of: (1) economic competitiveness and revitalization; (2) social equity, inclusion, and access to opportunity; (3) energy use and climate change; and (4) public health and environmental impact.	http://www.hud.gov/offices/cpd/communitydevelopment/programs/ http://portal.hud.gov/hudportal/HUD?src=/program_offices/economic_resilience/sustainable_communities_regional_planning_grants
CTDEEP Section 319 Grant Program	Clean Water Act Section 319 funds to effectively and efficiently address nonpoint source pollution are available to municipalities, nonprofit environmental organizations, regional water authorities/planning agencies, and watershed associations.	http://www.ct.gov/deep/cwp/view.asp?a=2719&q=325594&deepNav_GID=1654

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
CTDEEP Section 604(b) Grant Program	Under the federal Clean Water Act, Section 604(b) funds are awarded to CTDEEP to carry out water quality management planning including revising water quality standards; performing waste load allocation/total maximum daily loads, point and non-point source planning activities, water quality assessments and watershed restoration plans.	http://www.ct.gov/deep/cwp/view.asp?a=2688&Q=458026&depNav_GID=1511
CTDEEP Connecticut Clean Water Fund	The Connecticut Clean Water Fund (CWF) is the state's environmental infrastructure assistance program. The fund was established in 1986 to provide financial assistance to municipalities for planning, design and construction of wastewater collection and treatment projects. This program was developed to replace state and federal grant programs that had existed since the 1950s. The 1987 amendments to the Federal Clean Water Act required that states establish a revolving loan program by 1989. The fund was modified in 1996 to include the Drinking Water State Revolving Fund (DWSRF) to assist water companies in complying with the Safe Drinking Water Act by providing low cost financing. The CWSRF currently includes set-asides or reserves categories for green infrastructure, river restoration and small communities wastewater (including decentralized).	http://www.ct.gov/deep/cwp/view.asp?a=2719&q=325578&depnav_gid=1654
Connecticut Lakes Grant Program	Provides matching grants for lake restoration projects to municipalities, lake authorities, and lake taxing districts at lakes that are available to the general public for recreation. Funds for the Lakes Grant Program are made available through authorizations of the State Legislature and allocated by the State Bond Commission. The Lakes Grant Program requires a 25% match for studies and a 50% match for implementation of control measures. When funding is available for the Lakes Grant Program, notification is provided to every municipality in Connecticut and to groups who have previously inquired about funding for lake management projects.	http://www.ct.gov/deep/cwp/view.asp?a=2719&q=332726&depnav_gid=1654

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
Long Island Sound Study - Long Island Sound Research Grant Program	To support research that will enhance scientific understanding of Long Island Sound, and provide information needed by managers to protect and effectively manage the Sound and its valuable resources. Available to Connecticut academic institutions.	http://longislandsoundstudy.net/research-monitoring/lis-research-grant-program/
CTDEEP Hazard Mitigation Grant Program	Provides financial assistance to state and local governments for projects that reduce or eliminate the long-term risk to human life and property from the effects from natural hazards.	http://www.ct.gov/dep/cwp/view.asp?a=2720&q=325654&depNav_GID=1654
CTDEEP Landowner Incentive Program	The Wildlife Division's Landowner Incentive Program (LIP) provides technical advice and cost assistance to private landowners for habitat management that will result in the protection, restoration, reclamation, enhancement, and maintenance of habitats that support fish, wildlife, and plant species considered at-risk. This program has been made possible through grants from the U.S. Fish and Wildlife Service.	http://www.ct.gov/dep/cwp/view.asp?a=2723&q=325734&depNav_GID=1655
CTDEEP Long Island Sound License Plate Program	Section 14-21e of the Connecticut General Statutes (CGS) authorizes the issuance of the Long Island Sound license plate by the Department of Motor Vehicles, while CGS Section 22a-27k establishes the Long Island Sound Fund to be administered by the Department of Energy and Environmental Protection into which proceeds from the sale of the plates are deposited.	http://www.ct.gov/dep/cwp/view.asp?a=2705&q=323782&depNav_GID=1635
CTDEEP Open Space and Watershed Land Acquisition	The Open Space and Watershed Land Acquisition (OSWA) Grant Program provides financial assistance to municipalities and nonprofit land conservation organizations to acquire land for open space and to water companies to acquire land to be classified as Class I or Class II water supply property.	http://www.ct.gov/dep/cwp/view.asp?a=2706&q=323834&depNav_GID=1641

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
CTDEEP Recreation and Natural Heritage Trust Program	The Recreation and Natural Heritage Trust program was created by the Legislature in 1986 in order to help preserve Connecticut's natural heritage. It is the CTDEEP's primary program for acquiring land to expand the state's system of parks, forests, wildlife, and other natural open spaces.	http://www.ct.gov/dep/cwp/view.asp?a=2706&q=323840&depNav_GID=1641
CTDEEP Urban Forestry Grant Programs	America the Beautiful Urban Forestry Grants: Grants of up to $12,000 are available to assist municipalities and non-profits in local urban forestry efforts. Urban Forestry Outreach Grant: Grants for non-profit organizations in urbanized areas to foster outreach in these areas.	http://www.ct.gov/dep/cwp/view.asp?a=2697&q=322872&depNav_GID=1631&depNav=|
CT OPM Small Town Economic Assistance Program (STEAP)	Funds economic development, community conservation and quality of life projects for localities that are ineligible to receive Urban Action (CGS Section 4-66c) bonds. This program is administered by the Office of Policy and Management. STEAP funds are issued by the State Bond Commission and can only be used for capital projects. Eligible projects include projects involving environmental protection. STEAP fnds were recently award to the Town of Bolton for preparation of a management plan for Bolton Lakes.	http://www.ct.gov/opm/cwp/view.asp?Q=382970
American Rivers – NOAA Community-Based Restoration Program Partnership	These grants are designed to provide support for local communities that are utilizing dam removal or fish passage to restore and protect the ecological integrity of their rivers and improve freshwater habitats important to migratory fish.	http://www.americanrivers.org/initiative/grants/projects/american-rivers-and-noaa-community-based-restoration-program-river-grants-2/
FishAmerica Foundation Conservation Grants	FishAmerica, in partnership with the NOAA Restoration Center, awards grants to local communities and government agencies to restore habitat for marine and anadromous fish species. Successful proposals have community-based restoration efforts with outreach to the local communities.	http://www.fishamerica.org/grants.html

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
NFWF Five Star and Urban Waters Restoration Grant Program	The Five Star and Urban Waters Restoration Program seeks to develop nation-wide-community stewardship of local natural resources, preserving these resources for future generations and enhancing habitat for local wildlife. Projects seek to address water quality issues in priority watersheds, such as erosion due to unstable streambanks, pollution from stormwater runoff, and degraded shorelines caused by development. The program focuses on the stewardship and restoration of coastal, wetland and riparian ecosystems across the country.	http://www.nfwf.org/fivestar/Pages/home.aspx
NFWF Long Island Sound Futures Fund	The Long Island Sound Futures Fund supports projects in local communities that aim to protect and restore the Long Island Sound. It unites federal and state agencies, foundations and corporations to achieve high-priority conservation objectives. Funded activities demonstrate a real, on-the-ground commitment to securing a healthy future for the Long Island Sound.	http://longislandsoundstudy.net/about/grants/lis-futures-fund/
Corporate Wetlands Restoration Partnership (CWRP)	Coastal America is an action-oriented, results-driven process aimed at restoring and preserving vital coastal ecosystems and addressing our most critical environmental issues. The Coastal America Partnership was launched in 1991 and formalized in 1992 with a Memorandum of Understanding signed by nine sub-cabinet level agency representatives. These representatives committed their agencies to work together and integrate their efforts with state, local and nongovernmental activities. The Coastal America Partnership utilizes a number of tools and programs to facilitate its mission. These include the Corporate Wetlands Restoration Partnership (CWRP) and the network of Coastal Ecosystem Learning Centers (CELCs), and the Coastal America Partnership Awards program.	http://www.ctcwrp.org/9/
Trout Unlimited Embrace A Stream	Embrace-A-Stream (EAS) is a matching grant program administered by TU that awards funds to TU chapters and councils for coldwater fisheries conservation.	http://www.tu.org/conservation/watershed-restoration-home-rivers-initiative/embrace-a-stream

West River Watershed Management Plan - Potential Funding Sources

Funding Source	Description	Reference
Community Foundation for Greater New Haven	A variety of competitive funding opportunities for non-profit groups are offered by The Community Foundation for Greater New Haven.	http://www.cfgnh.org/Grant/AboutourGrantmaking/tabid/189/Default.aspx
The Kresge Foundation	This foundation's environment program launched an initiative that funds community driven efforts, directing support toward 1) climate resilience in coastal cities and regions; 2) climate resilience in low-income communities; 3) sustainable water-resources management in a changing climate; and 4) urban energy resilience. The Kresge Foundation provides funding through invited applications, as well as unsolicited proposals. Eligibility: U.S. based 501(c)(3) organizations (and Canadian equivalents). Government entities are also eligible.	www.kresge.org/programs/environment

Grant Search Resources

Please also see the following grant search resources for assistance in finding additional state, federal, local, and private sources of funding related to nonpoint source pollution management:

- Grants.gov
  http://grants.gov/
- Catalog of Federal Domestic Assistance
  https://www.cfda.gov/
- CTDEEP Watershed and Stormwater Funding Website
  http://www.ct.gov/dep/cwp/view.asp?a=2719&q=335494&depNav_GID=1654&pp=12&n=1
- EPA Catalog of Federal Funding Sources for Watershed Protection
  https://ofmpub.epa.gov/apex/watershedfunding/f?p=fedfund:1
- EPA Watershed Funding
  http://water.epa.gov/aboutow/owow/funding.cfm
- EPA Green Infrastructure Funding Website
  http://water.epa.gov/infrastructure/greeninfrastructure/gi_funding.cfm
- Foundation Center: Philanthropy News Digest
  http://foundationcenter.org/pnd/rfp/cat_environment.jhtml
- USDA National Agriculture Library: Water Quality Information Center
  http://wqic.nal.usda.gov/nal_display/index.php?info_center=7&tax_level=2&tax_subject=589&level3_id=0&level4_id=0&level5_id=0&topic_id=2342&&placement_default=0
- Climate Funding Opportunities
  https://adapt.nd.edu/resources/1645/download/Climate_Funding_Opportunities_July_2015.pdf

Other Nonpoint Source Funding Opportunities

Congressional Appropriation - Direct Federal Funding
State Appropriations - Direct State Funding
Membership Drives Membership drives can provide a stable source of income to support watershed management programs.
Donations Donations can be a major source of revenue for supporting watershed activities, and can be received in a variety of ways.
User Fees, Taxes, and Assessments Taxes are used to fund activities that do not provide a specific benefit, but provide a more general benefit to the community.
Rates and Charges State law authorizes some public utilities to collect rates and charges for the services they provide.
Stormwater Utility Districts A stormwater utility district is a legal construction that allows municipalities to designated management districts where storm sewers are maintained in order to the quality of local waters. Once the district is established, the municipality may assess a fee to all property owners.
Impact Fees Impact fees are also known as capital contribution, facilities fees, or system development charges, among other names.
Special Assessments Special assessments are created for the specific purpose of financing capital improvements, such as provisions, to serve a specific area.
Property Tax These taxes generally support a significant portion of a county's or municipality's non-public enterprise activities.

Other Nonpoint Source Funding Opportunities

Excise Taxes These taxes require special legislation, and the funds generated through the tax are limited to specific uses: lodging, food, etc.
Bonds and Loans Bonds and loans can be used to finance capital improvements. These programs are appropriate for local governments and utilities to support capital projects. Green Bonds are a growing mechanism for funding green projects, including green infrastructure and flood resilience projects. Green bonds are debt instruments issued to finance environmental projects focused on climate change initiatives. The identification and labeling of a green bond is typically based on a set of voluntary standards drafted by a consortium of investment banks that outlines the process for issuers to designate specific green projects. The guidelines specify that a bond issue qualifies as green if the issuer uses the proceeds solely for capital expenditures associated with green or climate-related environmental benefits in accordance with certain standards.
Investment Income Some organizations have elected to establish their own foundations or endowment funds to provide long-term funding stability. Endowment funds can be established and managed by a single organization-specific foundation or an organization may elect to have a community foundation to hold and administer its endowment. With an endowment fund, the principal or actual cash raised is invested. The organization may elect to tap into the principal under certain established circumstances.
Emerging Opportunities for Program Support for Water Quality Trading Allows regulated entities to purchase credits for pollutant reductions in the watershed or a specified part of the watershed to meet or exceed regulatory or voluntary goals. There are a number of variations for water quality credit trading frameworks. Credits can be traded, or bought and sold, between point sources only, between NPSs only, or between point sources and NPSs.
Mitigation and Conservation Banks Created by property owners who restore and/or preserve their land in its natural condition. Such banks have been developed by public, nonprofit, and private entities. In exchange for preserving the land, the "bankers" get permission from appropriate state and federal agencies to sell mitigation banking credits to developers wanting to mitigate the impacts of proposed development. By purchasing the mitigation bank credits, the developer avoids having to mitigate the impacts of their development on site. Public and nonprofit mitigation banks may use the funds generated from the sale of the credits to fund the purchase of additional land for preservation and/or for the restoration of the lands to a natural state.

Other Nonpoint Source Funding Opportunities

Public Private Partnerships (P3s)

Innovative financing mechanisms are being explored at the national level, particularly tapping into the resources of the private sector through public–private partnerships (P3s). Traditionally, water and wastewater infrastructure has been funded through municipal bonds, with help from EPA State Revolving Loan funds, while stormwater is typically funded either through its limited share of local general funds or stormwater utilities. The Chesapeake Bay states are exploring P3s to meet TMDL obligations for nutrients and sediment. A P3 is an arrangement between government and the private sector in which the private sector assumes a large share of the risk in terms of financing, constructing, and maintaining the infrastructure. Government repays the private sector over the long term if the infrastructure is built and maintained according to specifications. Prince George's County, Maryland is implementing a P3 program to retrofit 2000 acres of impervious surfaces in the public right of way. Private funds will finance 30% to 40% of the program costs upfront, enabling project construction to begin sooner and proceed more quickly. This program is part of the County's Watershed Protection and Restoration Program.